



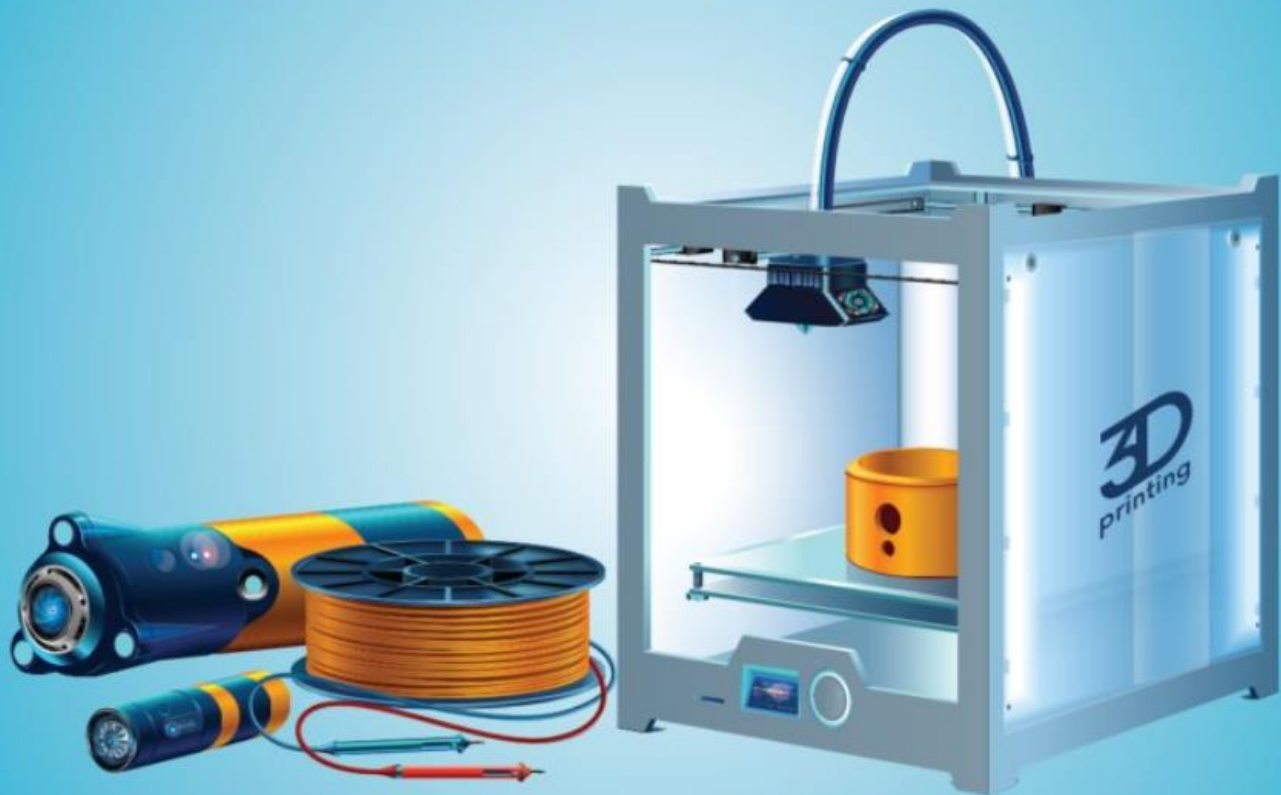
UNITED ARAB EMIRATES
MINISTRY OF EDUCATION



YEAR OF
ZAYED

Design and Technology

TEACHER'S GUIDE








Grade **7**

Volume

1

2

3

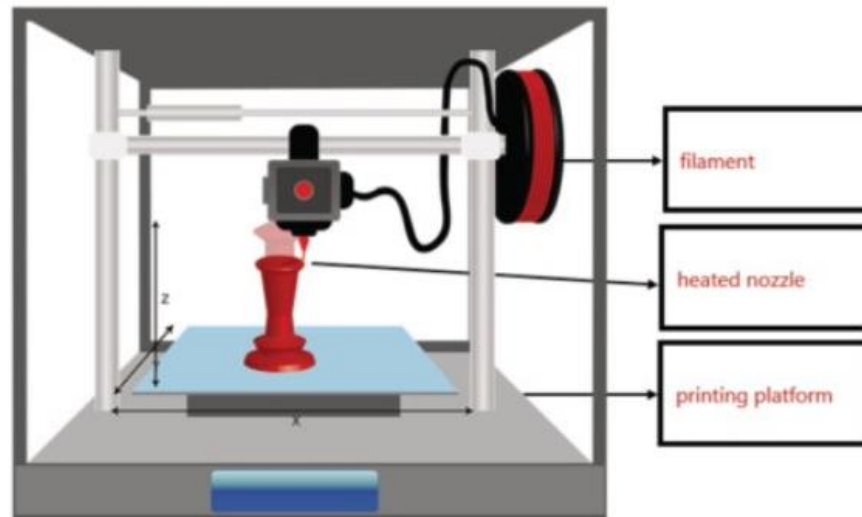
Grade	7	Subject	DT	Lesson number	1	Week number	1
Unit	Date		Time		Page number		
1	WC: 13/01/19		45 minutes		14-22		
Equipment required:				Learning objectives			
Student book				1.1. Demonstrate an understanding of 3D design and 3D printing. 1.2. Recognise the different hardware and software used in 3D design and 3D printing. 1.3. Understand additive and subtractive manufacturing.			
Keywords				3D design, 3D printing, additive, subtractive			
Starter/Introduction activity							
Time	Start by going through the Unit 1 overview, the keywords and learning outcomes for the unit.						
10 minutes							
Main							
Time	Introduce 3D design and printing. Then, explain the differences between additive and subtractive manufacturing.						
30 minutes							
<p>Activity 1</p> <p>Complete Activity 1 to identify examples of additive and subtractive manufacturing.</p> <p>Teacher answers:</p>							
		Subtractive					
		Additive					
		Subtractive					
		Additive					
		Additive					

Go through the correct answers before moving on. Explain Fused Deposit Modelling. Then, complete Activity 2.

Activity 2

Complete Activity 2 to identify the main components of a 3D printer.

Teacher answers:



Before the end of the session, go through the correct answers.

Plenary

Time 5 minutes	Summarise lesson, recapping the Learning objective and the key vocabulary used.
Assessment focus	Students should be able to identify examples of objects created with additive and subtractive manufacturing. They should also be able to identify the main components of a 3D printer.





Grade	7	Subject	DT	Lesson number	2	Week number	1
Unit	Date		Time		Page number		
1	WC: 13/01/19		45 minutes		23-28		
Equipment required:				Learning objectives			
Student book				1.2. Recognise the different hardware and software used in 3D design and 3D printing. 1.4. Define the design process.			
Keywords				3D printer, Think Design Process, Fused Deposit Modelling (FDM)			
Starter/Introduction activity							
Time 10 minutes		Start by reminding students about Fused Deposit Modelling and the Flash Forge printer.					
Main							

<p>Time 30 minutes</p>	<p>Activity 3</p> <p>Complete Activity 3 to explain 3D printing.</p> <p>Teacher answers:</p> <ul style="list-style-type: none"> The Flash Forge Finder uses fused deposition modelling which means it uses a plastic string called a filament. FDM is the most common technology used for desktop 3D printers. The filament is guided from a reel to a heated nozzle inside the 3D printer. The melted filament is laid on the platform as a layer. The software creates your design from the file you sent to the computer connected to the printer. <p>Go through the correct answers before moving on.</p> <p>Move on and explain how 3D printing is being used in the UAE. Then, introduce the topic 'From 2D to 3D' using the Think Design Process.</p> <p>Activity 4</p> <p>Complete Activity 4 to summarise what we have learned about 3D printing in the UAE and the design process.</p> <p>Teacher answers:</p> <table border="1" data-bbox="422 1008 1316 1164"> <tr> <td colspan="2">3D printing technology is:</td> </tr> <tr> <td>1. moving very slow.</td> <td></td> </tr> <tr> <td>2. changing how you design and make everything.</td> <td>✓</td> </tr> <tr> <td>3. not real.</td> <td></td> </tr> </table> <table border="1" data-bbox="422 1176 1316 1332"> <tr> <td colspan="2">A 3D-printed building in Dubai:</td> </tr> <tr> <td>1. cost 513,800 AED and at 100 times more than normal.</td> <td></td> </tr> <tr> <td>2. took 17 days to be printed.</td> <td>✓</td> </tr> <tr> <td>3. is the first 3D-printed office building in the world.</td> <td>✓</td> </tr> </table> <table border="1" data-bbox="422 1344 1316 1500"> <tr> <td colspan="2">The design process is:</td> </tr> <tr> <td>1. a way of solving a problem.</td> <td>✓</td> </tr> <tr> <td>2. a paper design of a product.</td> <td></td> </tr> <tr> <td>3. printing 3D objects.</td> <td></td> </tr> </table> <p>Before the end of the session, go through the correct answers.</p>	3D printing technology is:		1. moving very slow.		2. changing how you design and make everything.	✓	3. not real.		A 3D-printed building in Dubai:		1. cost 513,800 AED and at 100 times more than normal.		2. took 17 days to be printed.	✓	3. is the first 3D-printed office building in the world.	✓	The design process is:		1. a way of solving a problem.	✓	2. a paper design of a product.		3. printing 3D objects.	
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<p>Plenary</p>																									
<p>Time 5 minutes</p>	<p>Summarise lesson, recapping the learning objectives and key vocabulary used.</p>																								
<p>Assessment focus</p>	<p>Students should be able to explain 3D printing and how it is used as a design process for projects in the UAE.</p>																								

Grade	7	Subject	DT	Lesson number	3	Week number	1																
Unit	Date		Time		Page number																		
1	WC: 13/01/19		45 minutes		29-31																		
Equipment required:				Learning objectives																			
Student book				1.4. Define the design process.																			
Keywords				Think Design Process, design aspects																			
Starter/Introduction activity																							
Time 10 minutes	Start by having a deeper look at what design thinking looks like and explain each step in the process. Move on and challenge students to complete Activity 5.																						
Main																							
Time 30 minutes	<p>Activity 5</p> <p>Complete Activity 5 by evaluating the design aspects of an object in the classroom.</p> <p>Teacher could prepare a range of props to use for this and use the example answer to guide the students to evaluate the objects against the criteria.</p> <p>Teacher answers: – one example below</p> <table border="1"> <thead> <tr> <th>Criteria</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>Object</td> <td>mobile phone cover</td> </tr> <tr> <td>Colour</td> <td>clear/ no colour</td> </tr> <tr> <td>Size</td> <td>fits onto iPhone X</td> </tr> <tr> <td>Material</td> <td>clear plastic</td> </tr> <tr> <td>Special features</td> <td>lightweight and has spaces for the camera; silent button; charger port; speaker and microphone; has bumped volume and power button</td> </tr> <tr> <td>Overall design</td> <td>clear and lightweight cover; fits the phone perfectly; made of plastic; does not slip from hand</td> </tr> <tr> <td>What can be improved in the product?</td> <td>This phone case is very simple. We can improve it by adding a front cover, so that the phone is protected in the front as well. We can make this better by adding our name. The screen can have a small space to look at notifications and the time without opening and unlocking the phone.</td> </tr> </tbody> </table> <p>Before the end of the session, use Q&A and group discussion to share ideas about the chosen objects.</p>							Criteria	Example	Object	mobile phone cover	Colour	clear/ no colour	Size	fits onto iPhone X	Material	clear plastic	Special features	lightweight and has spaces for the camera; silent button; charger port; speaker and microphone; has bumped volume and power button	Overall design	clear and lightweight cover; fits the phone perfectly; made of plastic; does not slip from hand	What can be improved in the product?	This phone case is very simple. We can improve it by adding a front cover, so that the phone is protected in the front as well. We can make this better by adding our name. The screen can have a small space to look at notifications and the time without opening and unlocking the phone.
Criteria	Example																						
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Plenary																							
Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.																						
Assessment focus	Students should be able to evaluate design aspects of an existing object.																						

Grade	7	Subject	DT	Lesson number	1	Week number	2										
Unit	1	Date	WC: 20/01/19	Time	45 minutes	Page number	32-40										
Equipment required:				Learning objectives													
Student book				1.1. Demonstrate an understanding of 3D design and 3D printing. 1.2. Recognise the different hardware and software used in 3D design and 3D printing. 1.3. Understand additive and subtractive manufacturing. 1.4. Define the design process.													
Keywords				FDM, subtractive, extruded, design brief													
Starter/Introduction activity																	
Time	10 minutes	Start by linking the use of 3D printing in film and television. This is just one example of the growing use and need for expertise in 3D printing.															
Main																	
Time	30 minutes	<p>Challenge students to identify other uses of 3D printing. Students can work in pairs or groups to discuss before sharing ideas. Students could make notes on paper or create a presentation slide.</p> <p>Teacher answers: Some examples below:</p> <ul style="list-style-type: none"> • Architecture • Art • Concept models (prototyping) in many sectors • Manufacturing • Engineering • Construction • Healthcare <p>Encourage students to give examples of how 3D printing is used in each sector. One example is that it is used in art to prototype a sculpture before a large piece is commissioned (e.g. for a bronze statue).</p> <p>Move on and recap what we have learned so far using the Unit 1 summary and prompt students to complete Pop quiz 1.</p> <p>Pop quiz 1 Prompt students to complete Pop quiz 1. Remember, this is used as official assessment and students must answer the questions independently.</p> <p>Teacher answers:</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 20px;">1</td> <td>FDM is:</td> </tr> <tr> <td>A</td> <td>making lots of useful objects quickly and cheaply.</td> </tr> <tr> <td>B</td> <td>future decomposition process.</td> </tr> <tr> <td>C</td> <td>format design manufacturing.</td> </tr> <tr> <td>D</td> <td>front end design manufacturing.</td> </tr> </table>						1	FDM is:	A	making lots of useful objects quickly and cheaply.	B	future decomposition process.	C	format design manufacturing.	D	front end design manufacturing.
1	FDM is:																
A	making lots of useful objects quickly and cheaply.																
B	future decomposition process.																
C	format design manufacturing.																
D	front end design manufacturing.																

	What is subtractive manufacturing?
2	A a process which adds material to create an object
	B building an object when you need it
	C to take away the manufacturing process
	D removing material from an object until you have the finished object that you want

	Which image shows a subtractive manufacturing process?
3	<p>A </p>
	<p>B </p>
	<p>C </p>
	<p>D </p>

	The filament is melted, so that it can be:
4	A extruded through the nozzle onto a printing platform.
	B extruded through the printing platform onto a nozzle.
	C used for subtractive manufacturing.
	D used as rubbish.


	A design brief is a written description that:
5	A tests the final solution.
	B prints the final solution.
	C shows the final solution.
	D shows the requirements of the final solution.

End the session by going through the Unit 2 overview, the keywords and learning outcomes for the unit.

Plenary

Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.
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Assessment focus	Students should be able to identify uses of 3D printing in many sectors and demonstrate their knowledge by completing Pop quiz 1.
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Grade	7	Subject	DT	Lesson number	2	Week number	2
Unit	Date		Time		Page number		
2	WC: 20/01/19		45 minutes		41-45		
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				2.1. Demonstrate an understanding of Makers Empire 3D design software. 2.2. List main ways to protect against unintentional reveal of personal information.			
Keywords				Makers Empire, username, tokens, profile, Hero			
Starter/Introduction activity							
Time 10 minutes	Start by introducing the Makers Empire software as a 3D modelling tool. During the term, students will complete some initial design challenges and then follow a learning path to model a range of 3D objects in each unit. Emphasise that by completing design and challenges in the software, students will be rewarded with tokens that they can use to unlock new design items and features.						
Main							
Time 30 minutes	<p>Move on to creating a profile and personal Hero in Makers Empire. Teacher gives a demonstration.</p> <p>Challenge 1 – step-by-step guide Students should then follow the step-by-step guide to create a profile and personal Hero. Then, prompt students to write down their username (personal ID) and password, so they can access their profile and designs for the rest of the term.</p> <p>Teacher answers: Example of Hero below Students should aim to add more features.</p>  <p>The screenshot shows a 3D character model with a large grey rectangular head and a dark body. To the right is a control panel with a grid of colorful icons and a 'Start here!' button. The background is a simple brownish-grey floor and wall.</p>						
	Check student progress. Then, move onto Activity 1 to evaluate the design aspects of the Hero.						

Activity 1

Complete Activity 1 to evaluate the design aspects of the personal Hero students created in Makers Empire.

Teacher answers:

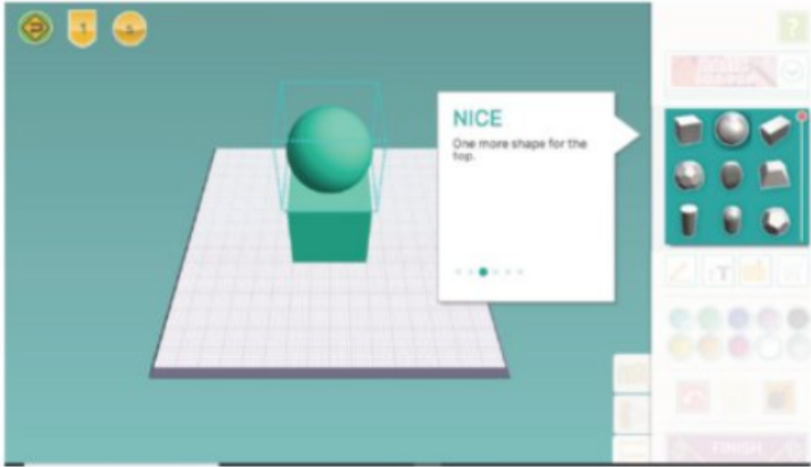
Each answer is unique to the Hero designed by the student. Look for matches between features applied in the software and selected in the student book.

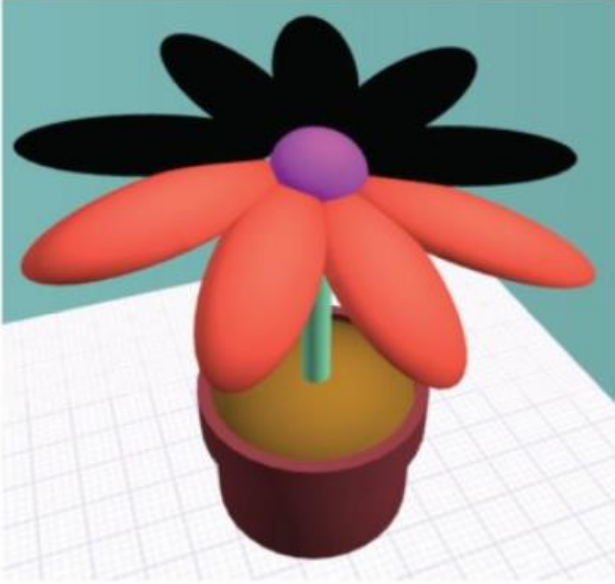
Explain that students can return to their Hero, challenges and designs at any time in Makers Empire to further develop their 3D designs.

Plenary

Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.
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Assessment focus	Students should be able to set up a profile and create a Hero using Makers Empire. They should also evaluate the design aspects of the Hero they created.
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Grade	7	Subject	DT	Lesson number	3	Week number	2
Unit	2	Date	WC: 20/01/19	Time	45 minutes	Page number	46-48
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				2.3. Develop skills in the Makers Empire software by completing a series of challenges.			
Keywords				challenges, Shaper Module, shapes			
Starter/Introduction activity							
Time	10 minutes	Start by reminding students about Makers Empire and check that all students have created a profile with a Hero. Explain that they will begin completing a range of challenges in the training lab part of the software.					
Main							
Time	30 minutes	<p>Introduce the chequered flag icon which appears when a challenge has been completed. Teacher gives a demonstration for Challenge 2 (make a tower).</p> <p>Challenge 2 – step-by-step guide Students should then follow the step-by-step guide to create their own tower and begin to develop modelling skills in Makers Empire.</p> <p>Teacher answers: Example of tower below Students should aim to add more features.</p>  <p>Make sure students click the 'finish' icon at the end of each challenge. End the session by reviewing shapes and tools used in the 'make a tower' activity. Then, remind students that they can return to challenges and designs at any time in Makers Empire to further develop their 3D designs.</p>					
Plenary							
Time	5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to create a tower using shapes in Makers Empire.					

Grade	7	Subject	DT	Lesson number	1	Week number	3
Unit	Date		Time		Page number		
2	WC: 27/01/19		45 minutes		48-50		
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				2.3. Develop skills in the Makers Empire software by completing a series of challenges. 2.4. Identify differences between the Blocker Module and Shaper Module.			
Keywords				password, colours, blocks, Blocker Module			
Starter/Introduction activity							
Time	Start by reminding students about Makers Empire and the challenges in the training lab part of the software. Teacher gives a demonstration for Challenge 3 (your favourite colours).						
10 minutes							
Main							
Time	Challenge 3 – step-by-step guide						
30 minutes	Students should then complete Challenge 2 by applying colours to a flower in the Shaper Module.						
	<p>Teacher answers: Example of a flower with some colours applied Students should aim to add more.</p>						
							
	Check progress and ensure students save progress by clicking the 'finish' icon. Then, move on to Challenge 4.						

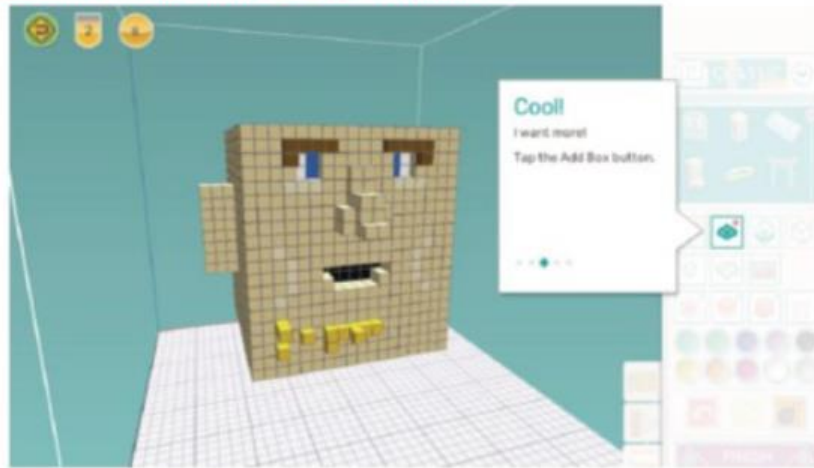
Challenge 4 – step-by-step guide

Students should then complete Challenge 4 by adding blocks to make a beard.

Teacher answers:

Example of a beard below

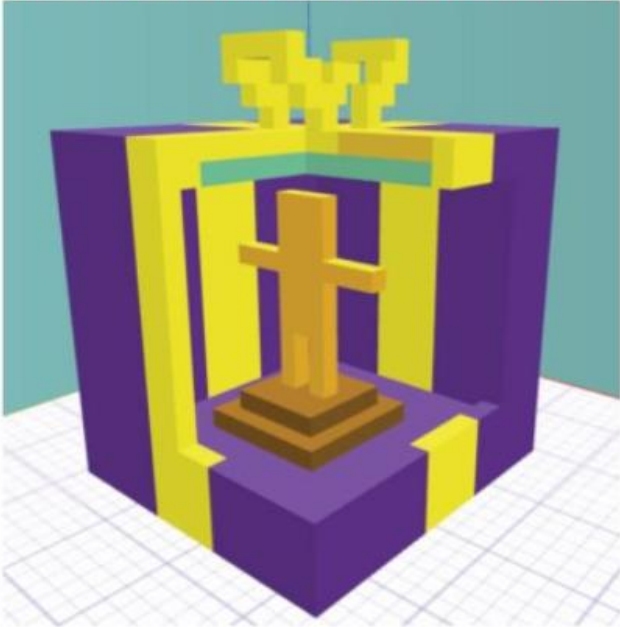
Students should aim to add more features.



Check progress and ensure students save progress by clicking the 'finish' icon. Remind students that they can return to challenges and designs at any time in Makers Empire to further develop their 3D designs.

Plenary

Time 5 Minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.
Assessment focus	Students should be able to apply colours to a flower and create a beard using the Blocker Module in Makers Empire.

Grade	7	Subject	DT	Lesson number	2	Week number	3
Unit	Date		Time		Page number		
2	WC: 27/01/19		45 minutes		50-51		
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				2.3. Develop skills in the Makers Empire software by completing a series of challenges. 2.4. Identify differences between the Blocker Module and Shaper Module.			
Keywords				remove blocks, colours			
Starter/Introduction activity							
Time	Start by reminding students about Makers Empire and the challenges in the training lab part of the software. Teacher gives a demonstration for Challenge 5 (open a present).						
10 minutes							
Main							
Time	Challenge 5 – step-by-step guide						
30 minutes	Students should then complete Challenge 5 by removing blocks to open the present. Check progress and ensure students save progress by clicking the 'finish' icon. Then, move on to Challenge 6.						
	<p>Teacher answers: Example of an opened present below Students should remove blocks to reveal what is inside the present.</p>						
							
	Check progress and ensure students save progress by clicking the 'finish' icon. Move on to Challenge 6. Teacher gives a demonstration for Challenge 6 (spooky painting).						

Challenge 6 – step-by-step guide

Students should then complete Challenge 6 by changing block colours to make their own spooky painting.

Teacher answers:

Example of a spooky painting

Students should use more colours.



Check progress and ensure students save progress by clicking the 'finish' icon. Remind students that they can return to challenges and designs at any time in Makers Empire to further develop their 3D designs.

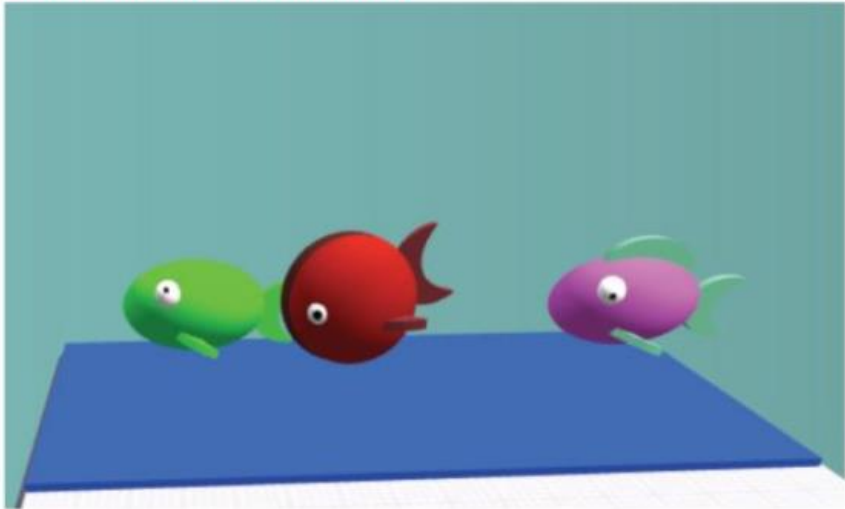
Plenary

Time
5 minutes

Summarise lesson, recapping the learning objectives and key vocabulary used.

**Assessment
focus**

Students should be able to remove blocks in the Blocker Module to open a present and apply colours to blocks to create a spooky painting in Makers Empire.

Grade	7	Subject	DT	Lesson number	3	Week number	3
Unit	2	Date	WC: 27/01/19	Time	45 minutes	Page number	51-56
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				2.4. Identify differences between the Blocker Module and Shaper Module.			
Keywords				moving shapes, 3D World, navigate			
Starter/Introduction activity							
Time 10 minutes		Start by reminding students about Makers Empire and the challenges in the training lab part of the software. Teacher gives a demonstration for Challenge 7 (fish out of water).					
Main							
Time 30 minutes		<p>Challenge 7 – step-by-step guide</p> <p>Students should then complete Challenge 7 by moving shapes to put the fish in the water. Check progress and ensure students save progress by clicking the 'finish' icon.</p> <p>Teacher answers: Example of fish put in the water</p>  <p>Check progress and ensure students save progress by clicking the 'finish' icon.</p> <p>Explain that students have now completed enough training lab challenges to unlock the 3D world in Makers Empire. Teacher gives a demonstration on the menu tabs and navigation in the Makers Empire 3D world menu. You could allow students a few minutes to explore the 3D world menu.</p>					

Challenge 8 / Challenge 9

Challenge 8 (grow your hair) and Challenge 9 (bug catcher) are optional and can be done at the teacher's discretion.

Move on and introduce the 'All About Me' project and put students into a group of 4 to answer the questions in Activity 2. Students could discuss favourite foods, sports, places, etc.

Activity 2

Complete Activity 2 by answering the 'All About Me' questions.

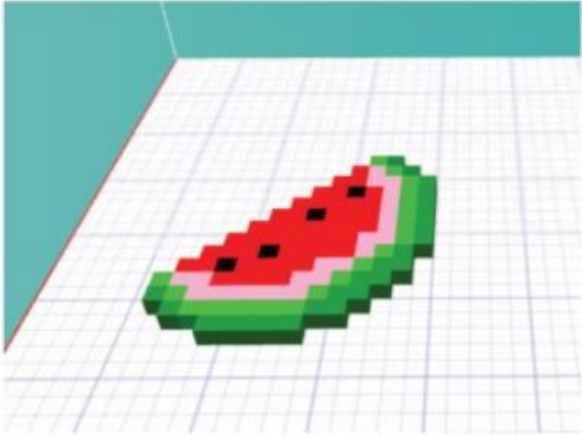
Teacher answers:

There are no incorrect answers here as these are about each student's individual interests and preferences.

Check progress. Ask students to share their answers in class discussion.

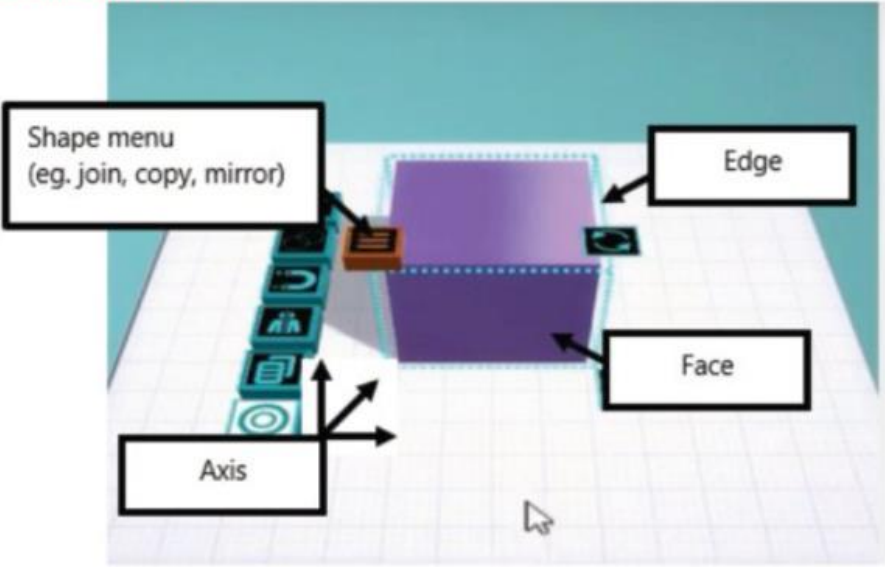
Plenary

Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.
Assessment focus	Students should be able to move objects in Makers Empire and use this skill to place fish into water. Students should have also discussed and answered the 'All About Me' questions.

Grade	7	Subject	DT	Lesson number	1	Week number	4
Unit	2	Date	WC: 03/02/19	Time	45 minutes	Page number	57-59
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				2.5. Create a model using Blocker Module.			
Keywords				3D World, Blocker Module, save design			
Starter/Introduction activity							
Time	Start by reminding students about the 'All About Me' project and continue with Activity 2. Students must now draw/sketch 4 of their favourite things.						
10 minutes							
Main							
Time	Check progress. Then, move on and introduce the Blocker Module in the 3D world where students can create their own designs. Teacher gives a demonstration here. Give students 5 minutes to experiment with the Blocker Module. Then, move onto Activity 3.						
30 minutes							
<p>Activity 3</p> <p>Students must choose 1 favourite thing (from the 4 they sketched earlier). Now they will make 4 different design drawings/sketches of their favourite thing.</p> <p>Check progress and when students have completed 4 design sketches, challenge them to use their chosen design to build their favourite thing using the Blocker Module.</p> <p>Teacher answer: Here is an example of a favourite thing (food) created in the Blocker Module.</p>							
							
Ensure students know how to save their designs in the Blocker Module. Introduce file naming here, e.g. Ahmed Al Blooshi Favourite Thing.							
Plenary							
Time	Summarise lesson, recapping the learning objectives and key vocabulary used.						
5 minutes							
Assessment focus				Students should be able to create one of their favourite things using the tools and features of the Blocker Module in Makers Empire.			

Grade	7	Subject	DT	Lesson number	2	Week number	4
Unit	Date		Time		Page number		
2	WC: 03/02/19		45 minutes		59-61		
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				2.5. Create a model using Blocker Module.			
Keywords				Blocker Module, save design, self-evaluation			
Starter/Introduction activity							
Time 20 minutes		Start by reminding students about the 'All About Me' project. Students should have now completed 4 sketched designs and began to create a model using the Blocker Module. Allow up to 20 minutes for students to finish making the chosen design using the Blocker Module.					
Main							
Time 20 minutes		Ensure students know how to save their finished designs in the Blocker Module. Explain that we will now review our performance so far this term by completing the self-evaluation.					
Self-evaluation Students should answer the questions to complete the self-evaluation.							
Teacher answers: Each answer is unique to the student. Check for matches between features applied in the software and student answers written in the book.							
End the session by recapping what we have learned so far using the Unit 2 summary.							
Unit 2 checklist Prompt students to use the checklist to make sure they have completed all activities so far this term.							
Plenary							
Time 5 minutes		Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to complete a model using the Blocker Module, understand and identify what they have achieved so far this term.					

Grade	7	Subject	DT	Lesson number	3	Week number	4																
Unit	Date		Time		Page number																		
3	WC: 03/02/19		45 minutes		64-70																		
Equipment required:				Learning objectives																			
Student book				3.3. Develop 3D models using the Shaper Module developed in Makers Empire.																			
Keywords				Shaper Module, 3D terminology																			
Starter/Introduction activity																							
Time	Start by going through the Unit 3 overview, the keywords and learning outcomes for the unit. Move on and introduce the Shaper Module in the 3D world where students can create their own designs. Teacher gives a demonstration here.																						
10 minutes																							
Main																							
Time	Give students 5 minutes to experiment with the Shaper Module. Then, move on to Activity 1 to summarise the Shaper Module.																						
30 minutes																							
<p>Activity 1</p> <p>Complete Activity 1 by filling in the blanks to create a summary.</p> <p>Teacher answers: The Shaper Module is a tool in Makers Empire. We can create 3D objects by adding and connecting shapes in the work space. We can also change the colour of the shapes using the palette. Text can also be added to the 3D object.</p> <p>Go through the correct answers before moving on. Introduce 3D terminology. Then, move on to Activity 2.</p> <p>Activity 2</p> <p>Complete Activity 2 by matching 3D terms to their meanings.</p> <p>Teacher answers:</p> <table border="1"> <thead> <tr> <th>Term</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>dimensions</td> <td>the height, width and depth of an object or shape (dimensions)</td> </tr> <tr> <td>extrude</td> <td>the labels we use for dimensions in 3D design. Height (x), Width (y), Depth (z) (axis)</td> </tr> <tr> <td>face</td> <td>changing the height, width or depth of an object (extrude)</td> </tr> <tr> <td>axis</td> <td>joining shapes to create a 3D object (intersect)</td> </tr> <tr> <td>scale</td> <td>making the size of a 3D model bigger or smaller (scale)</td> </tr> <tr> <td>edge</td> <td>the flat surfaces of a 3D shape or object (face)</td> </tr> <tr> <td>intersect</td> <td>the parts between the flat surfaces of a 3D shape or object (edge)</td> </tr> </tbody> </table> <p>Before the end of the session, go through the correct answers.</p>								Term	Definition	dimensions	the height, width and depth of an object or shape (dimensions)	extrude	the labels we use for dimensions in 3D design. Height (x), Width (y), Depth (z) (axis)	face	changing the height, width or depth of an object (extrude)	axis	joining shapes to create a 3D object (intersect)	scale	making the size of a 3D model bigger or smaller (scale)	edge	the flat surfaces of a 3D shape or object (face)	intersect	the parts between the flat surfaces of a 3D shape or object (edge)
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edge	the flat surfaces of a 3D shape or object (face)																						
intersect	the parts between the flat surfaces of a 3D shape or object (edge)																						
Plenary																							
Time	Summarise lesson, recapping the learning objectives and key vocabulary used.																						
5 minutes																							
Assessment focus				Students should be able to explain the Shaper Module and match 3D terminology with their descriptions.																			

Grade	7	Subject	DT	Lesson number	1	Week number	5
Unit	3	Date	WC: 10/02/19	Time	45 minutes	Page number	71-73
Equipment required:				Learning objectives			
Student book				3.1. Follow the design process to plan and design 3D objects. 3.2. Define and paper sketch the design elements for a range of 3D objects.			
Keywords				Shaper Module, 3D terminology, Project Brief, Design			
Starter/Introduction activity							
Time	10 minutes						
	Start by reminding students about 3D terms and the Shaper Module. Then, move on to Activity 3 to match 3D terms to features of the Shaper Module.						
Main							
Time	30 minutes						
	<p>Activity 3</p> <p>Complete Activity 3 by labelling the image of the Shaper Module with the relevant 3D terms.</p> <p>Teacher answers:</p>  <p>Go through the correct answers before moving on. Introduce the 'modelling a name tag' project and show the demonstration video. Then, remind students about the Think Design Process.</p> <p>Put students into groups or pairs to discuss the project. Then, prompt students to make notes about requirements, colours, shapes and sizes they could use for the name tag. Move on to Activity 4 to sketch 2 name tag designs.</p>						

Activity 4

Complete Activity 4 by drawing/sketching 2 designs using their notes and ideas.

Teacher answers:


To meet the requirements, the tag designs must have:

- the student's name.
- a key loop.

Before the end of the session, check student progress and share good student work with the rest of the class.

Plenary

Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.
Assessment focus	Students should be able to match 3D terminology to the features in Makers Empire, share ideas about the name tag project and create designs that meet the project requirements.

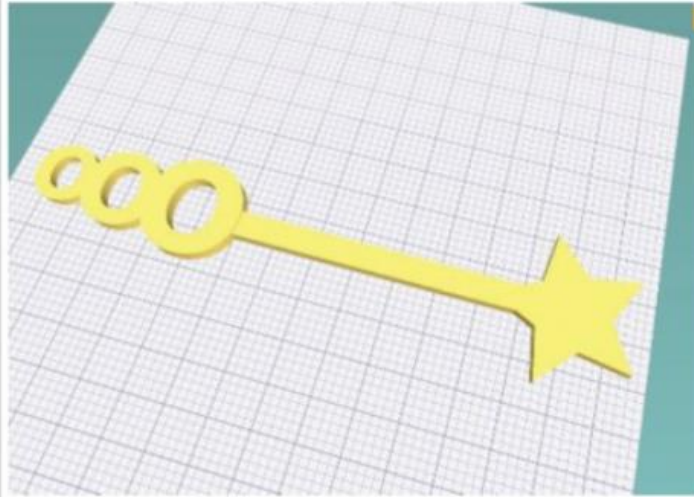
Grade	7	Subject	DT	Lesson number	2	Week number	5
Unit	Date		Time	Page number			
3	WC: 10/02/19		45 minutes	74-76			
Equipment required:			Learning objectives				
Student book Computer Makers Empire software			3.1. Follow the design process to plan and design 3D objects. 3.2. Define and paper sketch the design elements for a range of 3D objects. 3.3. Develop 3D models using the Shaper Module developed in Makers Empire.				
Keywords			Design, Model, Shaper Module				
Starter/Introduction activity							
Time 10 minutes	Start by reminding students about the name tag project and check progress with the Activity 4 sketched designs. Allow students a few minutes to complete their sketches, if required.						
Main							
Time 30 minutes	<p>Move on to creating the name tag models using the Shaper Module in Makers Empire.</p> <p>Modelling a name tag – step-by-step guide Students should follow the modelling a name tag step-by-step guide to model 2 name tags using the designs from Activity 4.</p> <p>Teacher answers: Below is one example of a name tag created in the Shaper module.</p>  <p>Before the end of the session, remind students to save their designs.</p>						
Plenary							
Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.						
Assessment focus	Students should be able to model two name tags based on their designs using the Shaper Module in Makers Empire.						

Grade	7	Subject	DT	Lesson number	3	Week number	5
Unit	3	Date	WC: 10/02/19	Time	45 minutes	Page number	77-79
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				3.4. Test 3D models against object requirements.			
Keywords				Test, Requirements, Project Brief			
Starter/Introduction activity							
Time	10 minutes	Start by reminding students about the name tag project and check progress with the 3D name tag designs. Allow students a few minutes to complete their 3D designs, if required.					
Main							
Time	30 minutes	<p>Explain the importance of testing an object against requirements. Then, move on to Activity 5 to test the name tag models.</p> <p>Activity 5</p> <p>Complete Activity 5 by ticking yes or no against each requirement and explaining any 'no' answers. After completing the test tables, decide which model is best and explain why.</p> <p>Teacher answer: Each answer is unique to the student. Check for matches between features of the models created in the software and the test results.</p> <p>Check student progress by questioning their test results. Share good student work with the rest of the class.</p> <p>Introduce the bubble blower stick project and show the demonstration video. Then, remind students about the Think Design Process.</p> <p>Activity 6</p> <p>Complete Activity 6. Use a Mind Map for your ideas about requirements, colours, shapes and sizes for the bubble blower stick. Students can work in pairs or groups for this activity.</p> <p>Teacher answers: Answer should include bubble blower requirements:</p> <ul style="list-style-type: none"> • A handle • One or more loops/shapes to blow bubbles <p>There are no incorrect answers here as colours, shapes and sizes are about each student's individual choices.</p>					
Plenary							
Time	5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to test the name tag models against requirements to decide which model is best. They should also discuss and create a Mind Map for their ideas (the bubble blower stick project).					

Grade	7	Subject	DT	Lesson number	1	Week number	6
Unit	Date		Time	Page number			
3	WC: 17/02/19		45 minutes	79-83			
Equipment required:			Learning objectives				
Student book Computer Makers Empire software			3.1. Follow the design process to plan and design 3D objects. 3.2. Define and paper sketch the design elements for a range of 3D objects. 3.3. Develop 3D models using the Shaper Module developed in Makers Empire.				
Keywords			Design, Model, Shaper Module				
Starter/Introduction activity							
Time 10 minutes	Start by reminding students about the bubble blower stick project and check progress with the Mind Map of ideas. Allow students a few minutes to complete their Mind Maps, if required. Then, discuss answers and ideas.						
Main							
Time 30 minutes	<p>Move on to Activity 7 to sketch 2 bubble blower stick designs.</p> <p>Activity 7</p> <p>Complete Activity 7 by drawing/sketching 2 designs using their notes and ideas.</p> <p>Teacher answers: To meet the requirements, the bubble blower designs must have:</p> <ul style="list-style-type: none"> • a handle. • one or more loops/shapes to blow bubbles. <p>Check student progress and share good student work with the rest of the class.</p> <p>Move on to creating the bubble blower stick models using the Shaper Module in Makers Empire.</p> <p>Modelling a bubble blower stick – step-by-step guide Students should follow the modelling a bubble blower stick step-by-step guide to model 2 bubble blowers using the designs from Activity 7.</p>						

Teacher answers:

Below is one example of a bubble blower stick created in the Shaper Module.



Before the end of the session, remind students to save their designs.

Plenary

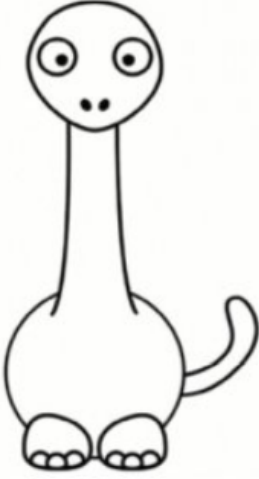
Time
5 minutes

Summarise lesson, recapping the learning objectives and key vocabulary used.

Assessment focus

Students should be able to create bubble blower stick designs that meet the project requirements. Then, they should model two bubble blower sticks based on the designs using the Shaper Module in Makers Empire.

Grade	7	Subject	DT	Lesson number	2	Week number	6
Unit	Date		Time		Page number		
3	WC: 17/02/19		45 minutes		83-87		
Equipment required:				Learning objectives			
Student book				3.3. Develop 3D models using the Shaper Module developed in Makers Empire.			
Computer				3.4. Test 3D models against object requirements.			
Makers Empire software							
Keywords				Model, Shaper Module, Test, Requirements			
Starter/Introduction activity							
Time 10 minutes		Start by reminding students about the bubble blower stick project and check progress with the 3D bubble blower stick designs. Allow students a few minutes to complete their 3D designs, if required.					
Main							
Time 30 minutes		Remind students about the importance of testing an object against requirements. Then, move on to Activity 8 to test the bubble blower stick models.					
		<p>Activity 8 Complete Activity 8 by ticking yes or no against each requirement and explaining any 'no' answers. After completing the test tables, decide which model is best and explain why.</p> <p>Teacher answers: Each answer is unique to the students. Check for matches between features of the models created in the software and the test results.</p> <p>Check student progress by questioning their test results. Share good student work with the rest of the class.</p> <p>Move on and recap what we have learned so far using the Unit 3 summary and prompting students to complete the Unit 3 Pop quiz.</p> <p>Pop quiz 2 Teachers must prepare their own questions with multiple-choice answers for Pop quiz 2 based on the Unit 3 content.</p> <p>Prompt students to complete Pop quiz 2. Remember, this is used as official assessment and students must answer the questions independently. Teachers must mark the pop quiz and enter the results on to the Learning Management System.</p>					
Plenary							
Time 5 minutes		Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to test the bubble blower stick models against requirements to decide which model is best and demonstrate their knowledge by completing Pop quiz 2.					

Grade	7	Subject	DT	Lesson number	3	Week number	6
Unit	Date		Time		Page number		
4	WC: 17/02/19		45 minutes		90-93		
Equipment required:				Learning objectives			
Student book				4.4. Apply the design process to plan, design and model solutions.			
Keywords				symmetry, bilateral symmetry, asymmetrical, Project Brief			
Starter/Introduction activity							
Time	Start by going through the Unit 4 overview, the keywords and learning outcomes for the unit. Introduce symmetry and emphasise that we can see bilateral symmetry in many animals.						
10 minutes							
Main							
Time	Activity 1						
30 minutes	Complete Activity 1 by using the line of symmetry, like a mirror, on the dinosaur. Draw/sketch the other side of the image. Students may also add a tail to the sketch.						
	<p>Teacher answer:</p> 						
	<p>Students may not add a tail without teacher prompting.</p> <p>Check student progress and identify good student work to share with the class. Move on to Activity 2 to identify more symmetry in animals and nature.</p>						

Activity 2

Complete Activity 2 by drawing a line of symmetry through each image.

Teacher answer:

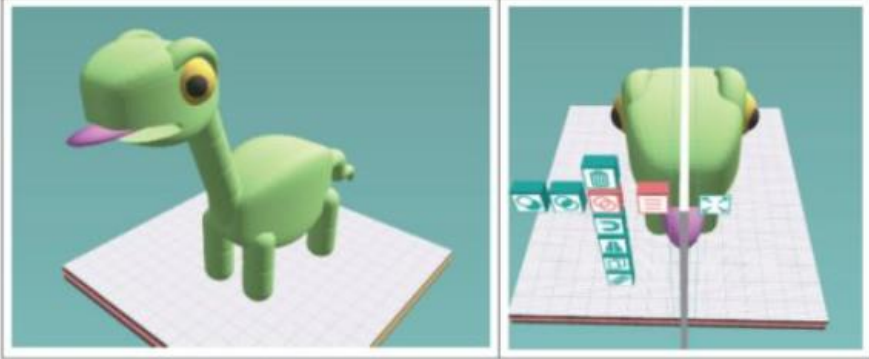


Before the end of the session, introduce the modelling a dinosaur project and emphasise that the dinosaur model they produce must include symmetrical features.

Plenary

Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.
Assessment focus	Students should be able to use symmetry to complete a sketch and add lines of symmetry to images to show bilateral symmetry in nature.

Grade	7	Subject	DT	Lesson number	1	Week number	7
Unit	4	Date	WC: 24/02/19	Time	45 minutes	Page number	93-96
Equipment required:				Learning objectives			
Student book				4.4. Apply the design process to plan, design and model solutions.			
Keywords				Project Brief, Requirements, Design			
Starter/Introduction activity							
Time 10 minutes	Start by reminding students about the 'modelling a dinosaur' project. Show the demonstration video. Then, remind students about the Think Design Process.						
Main							
Time 30 minutes	<p>Activity 3</p> <p>Complete Activity 3. Create a Mind Map for your ideas about requirements, colours, shapes and sizes for the dinosaur model. Students can work in pairs or groups for this activity. Allow students 10 minutes to complete their Mind Maps. Then, discuss answers and ideas.</p> <p>Teacher answer: Answer should include dinosaur requirements:</p> <ul style="list-style-type: none"> • A face • Legs • Symmetrical features <p>There are no incorrect answers here as colours, shapes and sizes are about each student's individual choices.</p> <p>Move on to Activity 4 to sketch a design for the dinosaur.</p> <p>Activity 4</p> <p>Complete Activity 4 by drawing/sketching a design using their notes and ideas, remembering that the design must be symmetrical.</p> <p>Teacher answer: To meet the requirements, the dinosaur design must have:</p> <ul style="list-style-type: none"> • a face. • legs. • symmetrical features. <p>Before the end of the session, check student progress and share good student work with the rest of the class.</p>						
Plenary							
Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.						
Assessment focus	Students should be able to discuss and create a Mind Map for their ideas for the dinosaur project. They should be able to create a design that meets the project requirements.						

Grade	7	Subject	DT	Lesson number	2	Week number	7
Unit	Date		Time		Page number		
4	WC: 24/02/19		45 minutes		96-98		
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				4.4. Apply the design process to plan, design and model solutions.			
Keywords				Design, Model, Shaper Module			
Starter/Introduction activity							
Time 10 minutes		Start by reminding students about the dinosaur project and check progress with the Activity 4 sketched design. Allow students a few minutes to complete their sketch, if required.					
Main							
Time 30 minutes		<p>Move on to creating the dinosaur model using the Shaper Module in Makers Empire.</p> <p>Modelling a dinosaur – step-by-step guide Students should follow the 'modelling a dinosaur' step-by-step guide to model a dinosaur using the design from Activity 4.</p> <p>Again, emphasise use of symmetry. Teacher may want to demonstrate the copy and mirror tools in Makers Empire.</p> <p>Teacher answer: Below is one example of a dinosaur created in the Shaper Module including a thin rectangle as a line of symmetry.</p>					
							
		Before the end of the session, remind students to save their design.					
Plenary							
Time 5 minutes		Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to model a dinosaur based on their design using the Shaper Module in Makers Empire. Students should be able to use a thin rectangle to show the symmetry in their dinosaur model.					

Grade	7	Subject	DT	Lesson number	3	Week number	7
Unit	Date		Time		Page number		
4	WC: 24/02/19		45 minutes		97-100		
Equipment required:			Learning objectives				
Student book Computer Makers Empire software			4.4. Apply the design process to plan, design and model solutions. 4.5. Test and evaluate 3D objects and individual performance.				
Keywords			Model, Shaper Module, Test, Requirements				
Starter/Introduction activity							
Time 10 minutes		Start by reminding students about the dinosaur project and check progress with the 3D dinosaur designs. Allow students a few minutes to complete their 3D designs, if required.					
Main							
Time 30 minutes		<p>Remind students about the importance of testing an object against requirements. Then, move on to Activity 5 to test the dinosaur model.</p> <p>Activity 5</p> <p>Complete Activity 5 by ticking yes or no against each requirement and explaining any 'no' answers.</p> <p>Teacher answer: Each answer is unique to the students. Check for matches between features of the model created in the software and the test results.</p> <p>Check student progress by questioning their test results. Share good student work with the rest of the class.</p> <p>After completing the test tables, introduce self-reflection and how it is important to review your skills and performance if you want to improve in future.</p> <p>Activity 6</p> <p>Complete Activity 6 to identify at least one good aspect of performance in the project (what went well) and one aspect that could be improved (even better if).</p> <p>Students could consider any of the following, e.g. understanding the brief, design sketches, modelling in the software and/or testing.</p> <p>Teacher answer: Each answer is unique to the students. Check for matches between student performance and the self-reflection answers.</p> <p>End the session by reviewing student answers. This could be done as a class discussion or with questions and answers.</p>					
Plenary							
Time 5 minutes		Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to test the dinosaur model against requirements and complete the self-reflection to identify how they can improve their performance in future.					

Grade	7	Subject	DT	Lesson number	1	Week number	8												
Unit	Date		Time		Page number														
4	WC: 03/03/19		45 minutes		101-105														
Equipment required:				Learning objectives															
Student book				4.1. Apply logical thinking for solving real-world problems. (G7.2.1.1.1) 4.2. Define simulation. (G7.2.3.1.1) 4.3. Identify what kinds of problems can be solved using modelling and simulation. (G7.2.3.1.2)															
Keywords				modelling, simulation, Project Brief, algorithm, logical thinking															
Starter/Introduction activity																			
Time 10 minutes		Start by introducing simulation and modelling. Emphasise the difference between 3D modelling, and mathematical simulation and modelling.																	
Main																			
Time 30 minutes		<p>Move on to Activity 7 to summarise the links between 3D modelling and mathematical modelling.</p> <p>Activity 7</p> <p>Complete Activity 7 by filling in the blanks using the information in the student book. Go through the correct answers before moving on.</p> <p>Teacher answers: Computer simulations are used for mathematical modelling systems. We can test 3D models using mathematical simulation. For example, we could test a 3D-modelled car with a physics simulation to test aerodynamics.</p> <p>Introduce the maze project and show the demonstration video. Then, move on to Activity 8 to plan the steps (tasks) in the maze project.</p> <p>Activity 8</p> <p>Complete Activity 8 to put the Think Design Process in order, so we can follow it to complete the maze project.</p> <p>Teacher answers:</p> <table border="1"> <thead> <tr> <th>Number</th> <th>Step</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Brief: Understand the task.</td> </tr> <tr> <td>2</td> <td>Design: Sketch design.</td> </tr> <tr> <td>3</td> <td>Model: Create 3D model using Blocker Module</td> </tr> <tr> <td>4</td> <td>Test: Look back at the requirements. Did you do everything?</td> </tr> <tr> <td>5</td> <td>Self-reflection: Review your performance.</td> </tr> </tbody> </table> <p>Go through the correct answers before moving on to Activity 9 to design the maze.</p>						Number	Step	1	Brief: Understand the task.	2	Design: Sketch design.	3	Model: Create 3D model using Blocker Module	4	Test: Look back at the requirements. Did you do everything?	5	Self-reflection: Review your performance.
Number	Step																		
1	Brief: Understand the task.																		
2	Design: Sketch design.																		
3	Model: Create 3D model using Blocker Module																		
4	Test: Look back at the requirements. Did you do everything?																		
5	Self-reflection: Review your performance.																		

Activity 9

Complete Activity 9 by shading the blocks in to create a maze. Emphasise that the maze must have an entrance, exit and pathways for the ball bearing.

Teacher answers:

To meet the requirements, the maze design must have:

- an entrance.
- pathways for a 3mm ball bearing.
- an exit.


Plenary

Time
5 minutes

Summarise lesson, recapping the learning objectives and key vocabulary used.

**Assessment
focus**

Students should be able to summarise modelling and simulation. Students should also be able to put the steps of the Think Design Process in order and produce a design to meet the maze project requirements.

Grade	7	Subject	DT	Lesson number	2	Week number	8
Unit	4	Date	WC: 03/03/19	Time	45 minutes	Page number	105-109
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				4.4. Apply the design process to plan, design and model solutions.			
Keywords				model, Blocker Module			
Starter/Introduction activity							
Time	10 minutes	Start by reminding students about the maze project and check progress with the Activity 9 design. Allow students a few minutes to complete their design, if required.					
Main							
Time	30 minutes	<p>Move on to creating the maze models using the Blocker Module in Makers Empire.</p> <p>Activity 7</p> <p>Students should follow the 'modelling a maze' step-by-step guide to model the maze using the design from Activity 9.</p> <p>Teacher answer: Below is one example of a maze created in the Blocker Module.</p>  <p>Before the end of the session, check progress and remind students to save their designs.</p>					
Plenary							
Time	5 minutes	Summarise lesson, recapping the learning objectives and the key vocabulary used.					
Assessment focus		Students should be able to model a maze based on their design using the Blocker Module in Makers Empire.					

Grade	7	Subject	DT	Lesson number	3	Week number	8
Unit	Date		Time		Page number		
4	WC: 03/03/19		45 minutes		106-113		
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				4.5. Test and evaluate 3D objects and individual performance.			
Keywords				Test, Requirements			
Starter/Introduction activity							
Time 10 minutes	Start by reminding students about the maze project and check progress with the 3D maze design. Allow students a few minutes to complete their 3D designs, if required.						
Main							
Time 30 minutes	<p>Remind students about the importance of testing an object against requirements. Then, move on to Activity 10 to test the maze model. Check student progress by questioning their test results. Share good student work with the rest of the class.</p> <p>Activity 10</p> <p>Complete Activity 10 by ticking yes or no against each requirement and explaining any 'no' answers.</p> <p>Teacher answer: Each answer is unique to the students. Check for matches between features of the model created in the software and the test results.</p> <p>After completing the test tables, remind students about self-reflection and how it is important to review your skills and performance if you want to improve in future.</p> <p>Activity 11</p> <p>Complete Activity 11 to identify at least one good aspect of performance in the project (what went well) and one aspect that could be improved (even better if). Students could consider any of the following, e.g. understanding the brief, design sketches, modelling in the software and/or testing.</p> <p>Teacher answer: Each answer is unique to the students. Check for matches between student performance and the self-reflection answers.</p> <p>End the session by recapping what we have learned so far using the Unit 4 summary,</p>						

End of unit quiz

Prompt students to complete the end of unit 4 quiz.

Teacher answers:

1. You can see symmetry in animals.

(True)

2. You used the Blocker Module to model a dinosaur.

(False)

3. What kind of modelling does simulation use?

(Mathematical modelling)

4. Which module did you use to model the maze?

(Blocker Module)

5. To improve our own skills, we should complete what?

(Performance evaluation)

Plenary

Time

5 minutes

Summarise lesson, recapping the learning objectives and key vocabulary used.

**Assessment
focus**

Students should be able to test the maze model against requirements and complete the self-reflection to identify how they can improve their performance in future. Students should also demonstrate their knowledge by completing the end of unit quiz.

Grade	7	Subject	DT	Lesson number	1	Week number	9
Unit	5	Date	WC: 10/03/19	Time	45 minutes	Page number	116-123
Equipment required:		Learning objectives					
Student book		5.2. Apply the development cycle to plan and design possible solutions for the required object.					
Keywords		Project Brief, Requirements					
Starter/Introduction activity							
Time	5 minutes	Start by going through the Unit 5 overview, the keywords and learning outcomes for the unit. Introduce the 'entrance to community sculpture' project.					
Main							
Time	35 minutes	<p>Move on to Activity 1 to develop ideas about a sculpture at the entrance to your town/city/community. Give no more than 15 minutes to complete Activity 1 and Activity 2.</p> <p>Activity 1</p> <p>Complete Activity 1 by answering the community sculpture questions. Students can work in pairs or groups to discuss ideas first.</p> <p>Teacher answer: The answers here should relate to the local city/town/community. Accept all sensible suggested answers.</p> <p>Check answers. Then, move on to Activity 2 to create a Mind Map for ideas, symbols and images that represent your culture and community.</p> <p>Activity 2</p> <p>Complete Activity 2 by adding ideas, symbols and images to the Mind Map.</p> <p>Teacher answer: The answers here should relate to the local city/town/community. Accept all sensible suggested answers.</p> <p>Check answers. Then, move on.</p> <p>Activity 3</p> <p>Activity 3 is optional and can be used to research existing entrance sculptures. Alternatively, teacher could prepare some examples to show.</p> <p>End the session by deciding on the requirements for the entrance sculpture.</p> <p>Activity 4</p> <p>Students should complete Activity 4 to identify their own requirements for the sculpture.</p> <p>Teacher answers: (e.g. three requirements, images to use, how it will represent the community, be suitable for the proposed location in the community).</p>					
Plenary							
Time	5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to discuss and create a Mind Map for ideas for the community sculpture project and create individual requirements for their sculpture					

Grade	7	Subject	DT	Lesson number	2	Week number	9
Unit	Date		Time		Page number		
5	WC: 10/03/19		45 minutes		123-126		
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				5.3. Model the chosen solution using Makers Empire.			
Keywords				Planning, Design			
Starter/Introduction activity							
Time 10 minutes		Start by reminding students about the community sculpture project. Then, move on to Activity 5.					
Main							
Time 30 minutes		<p>Activity 5</p> <p>Complete Activity 5 by drawing/sketching 2 designs to match the requirements from Activity 4. Then, answer the questions to choose your best design to model in Makers Empire.</p> <p>Teacher answer: The design here should match the individual requirements created in Activity 4.</p> <p>Check student progress. Share good student work with the rest of the class and move on.</p> <p>Activity 6</p> <p>Complete Activity 6 to identify the module you will use (Shaper or Blocker). Then, move on to create the model using Makers Empire.</p> <p>Teacher answer: The chosen module should be most appropriate for their chosen design (this could be either the Shaper or Blocker Module).</p> <p>Create the community sculpture model</p> <p>Students should now create the community sculpture model using their chosen module in Makers Empire. Before the end of the session, remind students to save their designs.</p>					
Plenary							
Time 5 minutes		Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to create community sculpture designs that meet the project requirements. Then, they should be able to choose a module in Makers Empire to develop a 3D model of the sculpture.					

Grade	7	Subject	DT	Lesson number	3	Week number	9
Unit	Date	Time	Page number				
5	WC: 10/03/19	45 minutes	127-131				
Equipment required:		Learning objectives					
Student book Computer Makers Empire software		5.1. Demonstrate an understanding of the object required for the Final Project.					
Keywords		Modelling, Testing, Self-reflection, Project Brief					
Starter/Introduction activity							
Time 10 minutes	Start by reminding students about the community sculpture project and check progress with the 3D sculpture design. Allow students a few minutes to complete their 3D designs if required.						
Main							
Time 30 minutes	<p>Move on and remind students about self-reflection. Review performance by completing the self-reflection.</p> <p>Self-reflection Complete the self-reflection by ticking the relevant boxes.</p> <p>Teacher answers: Each answer is unique to the students. Check for matches between the design, model created and the answers in the self-reflection.</p> <p>Teacher evaluates each community sculpture model and gives feedback to each student. Teacher evaluations can be completed during or after the lesson.</p> <p>Move on and introduce the Mars Mission project (modelling a rocket and badge). Discuss the project stages, tasks and the requirement to work independently.</p> <p>End the session by showing the UAE Hope Mission to Mars video to inspire the students for the project.</p>						
Plenary							
Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.						
Assessment focus	Students should be able to evaluate their performance in the community sculpture project and understand the stages and tasks for the final project.						

Grade	7	Subject	DT	Lesson number	1	Week number	11																		
Unit	Date		Time		Page number																				
5	WC: 24/03/19		45 minutes		128-138																				
Equipment required:				Learning objectives																					
Student book				5.1. Demonstrate an understanding of the object required for the Final Project. 5.2. Apply the development cycle to plan and design possible solutions for the required object.																					
Keywords				Planning, Design																					
Starter/Introduction activity																									
Time 10 minutes		Start by reminding students about the Mars Mission project and the requirement to work independently. Then, move on to Activity 7.																							
Main																									
Time 30 minutes		<p>Activity 7</p> <p>Complete Activity 7 by listing steps required to complete the project.</p> <p>Teacher answers:</p> <table border="1"> <tr><td>1</td><td>Complete the brief analysis.</td></tr> <tr><td>2</td><td>Do some research about other space missions.</td></tr> <tr><td>3</td><td>Draw some sketches.</td></tr> <tr><td>4</td><td>Create your mission badge using Blocker.</td></tr> <tr><td>5</td><td>Create your rocket using Shaper.</td></tr> <tr><td>6</td><td>Complete the tests to verify you have met the key objectives.</td></tr> <tr><td>7</td><td>Improve your models.</td></tr> <tr><td>8</td><td>Complete the final self-reflection.</td></tr> <tr><td>9</td><td>Get your work evaluated by the teacher.</td></tr> </table> <p>Go through correct answers before moving on to Activity 8.</p> <p>Activity 8</p> <p>Students must complete Activity 8 by answering the questions independently to demonstrate understanding of the project. Then, move on to research and designs.</p> <p>Teacher answers:</p> <ol style="list-style-type: none"> The Hope Mission is seeking to launch a probe to visit the planet of Mars. You will use the Blocker module to design the Mission Badge. You will use the Shaper module to design the Spacecraft. The Mission Badge that we design must be 3D. After completing each model, I should: take screenshots of my work. 						1	Complete the brief analysis.	2	Do some research about other space missions.	3	Draw some sketches.	4	Create your mission badge using Blocker.	5	Create your rocket using Shaper.	6	Complete the tests to verify you have met the key objectives.	7	Improve your models.	8	Complete the final self-reflection.	9	Get your work evaluated by the teacher.
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8	Complete the final self-reflection.																								
9	Get your work evaluated by the teacher.																								

Activity 9

Activity 9 is optional and can be used to research existing space missions. Alternatively, teacher could prepare and discuss the other missions.

Students should then create designs for their rocket and mission badge.

Activity 10, 11 and 12

Students must complete Activities 10, 11 and 12 independently by sketching designs for the rocket and name badge to meet the project requirements.

Teacher answers:

The rocket must meet these requirements:

- Use any of the shapes from the shape catalogue (can be created using the Shaper Module).
- The main shape of your rocket should be cylindrical.
- Use at least one of your own shapes created using the Draw Shape tool.
- Every part of your rocket must be connected to another part.
- You should use the Subtract Shapes tool in your design to remove some material.

The mission badge must meet these requirements:

- Your badge must use blocks (can be created using the Blocker Module).
- Your badge must be 3D.
- Your badge must have the UAE flag.
- Your badge must have the name of the mission.

Teacher should mark the project brief questions and planning/design activities using the teacher evaluation rubric.


Plenary

Time
5 minutes

Summarise lesson, recapping the learning objectives and key vocabulary used.

**Assessment
focus**

Students should be able to demonstrate an understanding of the project and create designs for the rocket and mission badge that meet the project requirements.

Grade	7	Subject	DT	Lesson number	2	Week number	11
Unit	Date		Time	Page number			
5	WC: 24/03/19		45 minutes	136-140			
Equipment required:			Learning objectives				
Student book Computer Makers Empire software			5.3. Model the chosen solution using Makers Empire.				
Keywords			modelling, evidence of work				
Starter/Introduction activity							
Time 5 minutes	Start by reminding students about the Mars Mission project and the requirement to work independently. Then, move on to modelling the designs in Makers Empire. Students must create the 3D models independently.						
Main							
Time 35 minutes	<p>Modelling the rocket</p> <p>Students should now model the rocket from their design using the Shaper Module. Student or teacher should then screenshot and print pictures of the finished model to be placed in the student work box into the textbook.</p> <p>Teacher answer: Below is one example of a rocket created in the Shaper Module.</p>  <p>The rocket model must meet these requirements:</p> <ul style="list-style-type: none"> • Use any of the shapes from the shape catalogue. • The main shape of your rocket should be cylindrical. • Use at least one of your own shapes created using the Draw Shape tool. • Every part of your rocket must be connected to another part. • You should use the Subtract Shapes tool in your design to remove some material. <p>Students should move on to modelling the mission badge.</p>						

Creating the mission badge

Students should now model the mission badge using the Blocker Module. Student or teacher should then screenshot and print pictures of the finished model to be placed in the student work box in the textbook.

Teacher answer:

Below is one example of a mission badge created in the Blocker Module.



The mission badge model must meet these requirements:

- Use blocks (be created with the Blocker Module).
- Your badge must be 3D.
- Your badge must have the UAE flag.

Your badge must have the name of the mission.

Teacher should mark the rocket and badge models using the teacher evaluation rubric.

Plenary

Time 5 minutes	Summarise lesson, recapping the learning objectives and key vocabulary used.
Assessment focus	Students should be able to model the rocket and mission badge in the Shaper and Blocker Modules in Makers Empire to meet the project requirements.

Grade	7	Subject	DT	Lesson number	3	Week number	11
Unit	Date		Time		Page number		
5	WC: 24/03/19		45 minutes		141-144		
Equipment required:				Learning objectives			
Student book Computer Makers Empire software				5.3. Model the chosen solution using Makers Empire.			
Keywords				modelling, evidence of work			
Starter/Introduction activity							
Time 5 minutes		Start by reminding students about the Mars Mission project and the requirement to work independently. Then, move on to testing the rocket and badge models created in Makers Empire.					
Main							
Time 35 minutes		<p>Testing Students should now complete the 'Testing' section by ticking the boxes in the test table. Allow students to make changes to the 3D models, if required, to pass the tests. Then, move on to self-reflection.</p> <p>Self-reflection Students should now complete the self-reflection to evaluate their performance in the different areas of the project and identify where they could improve.</p> <p>Teacher should mark the 'Testing' and 'Self-reflection' sections using the teacher evaluation rubric. Final marks should be submitted to the Learning Management System.</p> <p>Teacher should complete the feedback box to provide feedback to the students about what went well, even better if and comments including future targets. This could be done after the lesson.</p>					
Plenary							
Time 5 minutes		Summarise lesson, recapping the learning objectives and key vocabulary used.					
Assessment focus		Students should be able to test the rocket and mission badge models against the requirements and complete the self-reflection to identify how they can improve their performance in future.					