

تم تحميل هذا الملف من موقع المناهج الإماراتية



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[https://t.me/almanahj\\_bot](https://t.me/almanahj_bot)

The background features a complex, abstract 3D geometric composition. It consists of numerous overlapping, semi-transparent planes and rectangular blocks in various shades of gray, creating a sense of depth and perspective. The planes are oriented in different directions, some parallel to the viewer and others at various angles. The overall effect is a dynamic, layered structure that resembles a modern architectural or digital design. The composition is centered on a white background, with a dark gray vertical bar on the left and a dark gray horizontal bar at the bottom, suggesting a page layout.

# 3D Design in Practice

# E-safety

## Know about hazards in the class workspace



Do the word search below. Use the words in the table.

<i>caution</i>	<i>dangerous</i>	<i>blocking</i>
<i>tools</i>	<i>running</i>	

U	H	T	Q	R	D	Y	F	C
G	N	I	N	N	U	R	X	A
B	L	O	C	K	I	N	G	U
A	F	C	I	S	J	A	P	T
Z	Q	S	K	H	O	A	D	I
O	R	L	C	S	T	W	T	O
M	L	O	S	J	J	X	G	N
S	U	O	R	E	G	N	A	D
F	N	T	J	I	E	P	V	G

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# 3D design

## 3D design software



Match the features and descriptions.

3D design feature
Workspace/Canvas
View Cube
Drawing Tools
Shape Library
Shape Editing Tools
Development Modules
User Accounts

Description
This is used to rotate the canvas and design; you can look at it from different angles.
This has many shapes that can be used in your designs.
These are used to create and change your own shapes.
These are used to colour, resize, connect or delete shapes. Advanced options let you copy, mirror and cut new shapes.
These are different kinds of tools/features to create and edit 3D designs.
These are used to protect your work and/or get your work from anywhere with a network connection.
This is the area in the software where you draw or add shapes to make a 3D design.

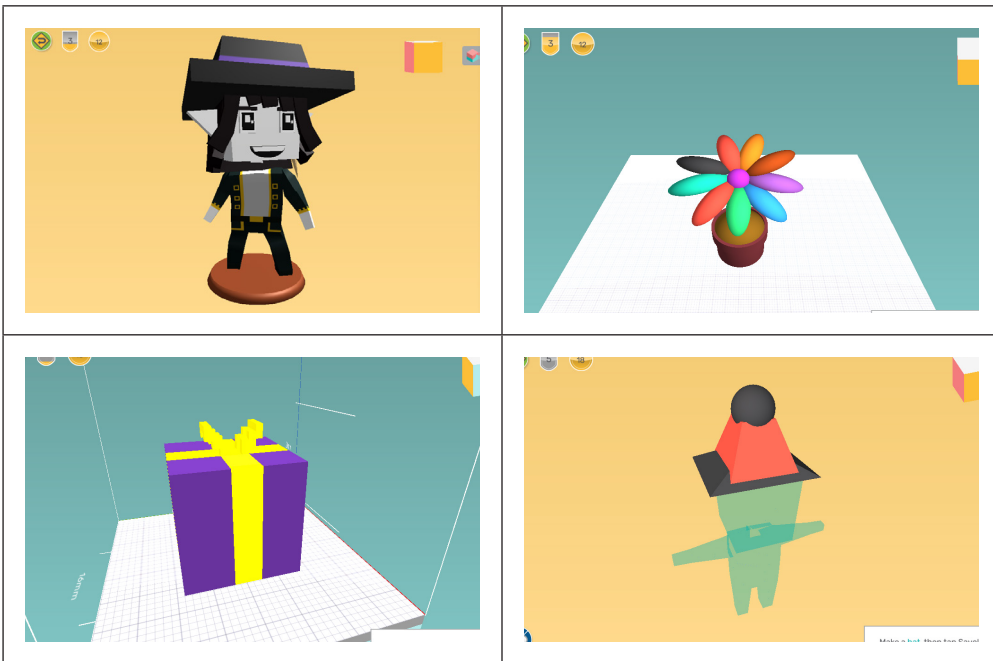
# 3D design challenges



Practise your skills with 3D design software. Complete some challenges in Makers Empire.

Start from the first challenge. Finish all challenges.

Here are some examples of some of the 3D design challenges.



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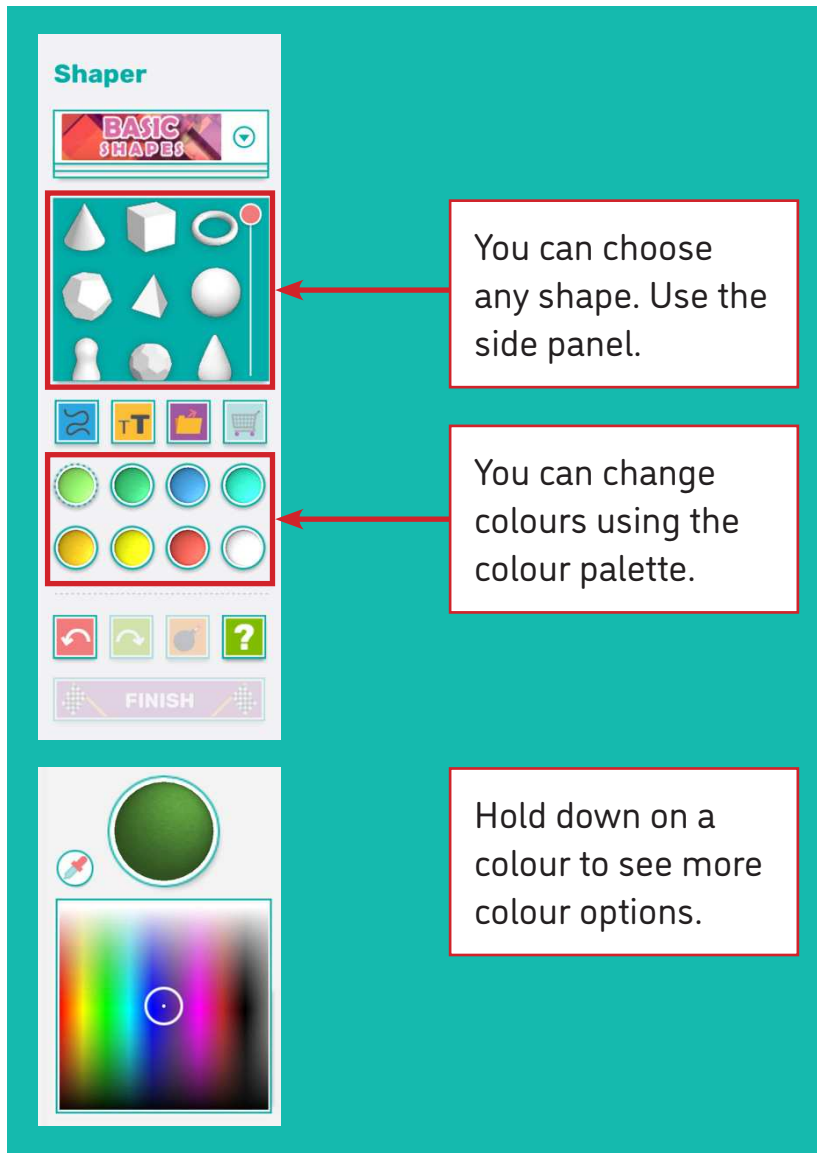
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## Modelling with shapes in a 3D design software

Use the guide below to do activities 4-9.



You can create more colours. Double tap on more colours.

## Extruding



In Makers Empire, extrude the diamond.

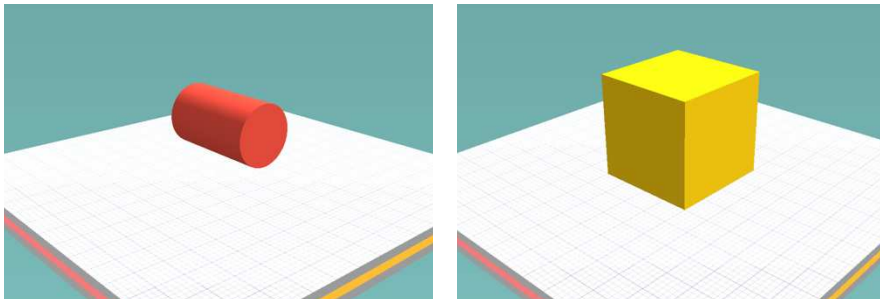
Use the  tool.

## Extrude cut



In Makers Empire, extrude cut a cylinder into a cube.

Use the  tool.



The extrude cut tool is used to cut holes into things, such as pens, door hinges, and sockets.

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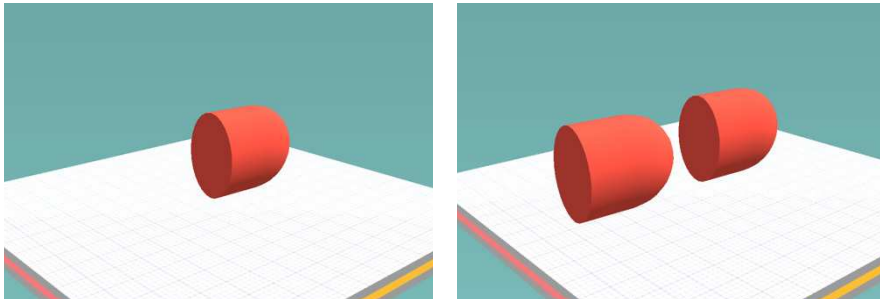
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## Mirror



In Makers Empire, mirror the half capsule shape. Then, join the two shapes together.

Use the  tool.



Mirroring is used a lot in 3D design to draw half of a shape. This saves a lot of time!



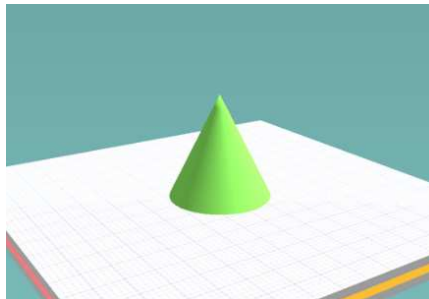
## Skew



### Activity 7

In Makers Empire, skew the cone shape.

Use the  tool.



## Magnet and the paperclip



### Activity 8

In Makers Empire, use the magnet tool to join the cone with the sphere.

Use the  or  tools.

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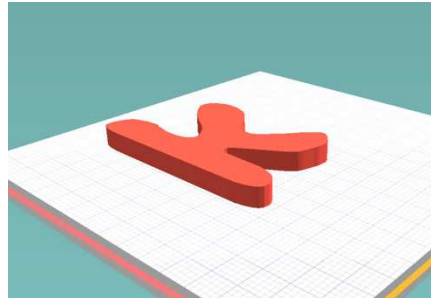
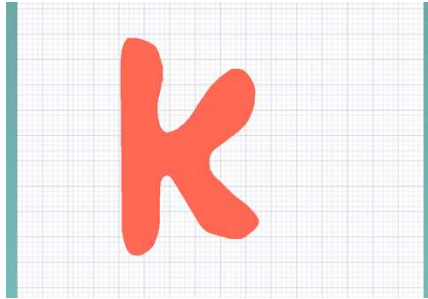
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## Freehand sketching



In Makers Empire, use the freehand tool to create the letter 'K'.

Use the  tool.



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## Activity 10

Theory

Create 2D designs for a laptop.

Later, you will make a 3D model using software (shape tools).

Remember to add a screen, key controls and a track pad.

Top view	Side view

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## Activity 11

Theory



Create a 3D perspective drawing for the laptop, using one-point perspective.



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You use artistic skills when you sketch 2D and 3D designs.

## Activity 12

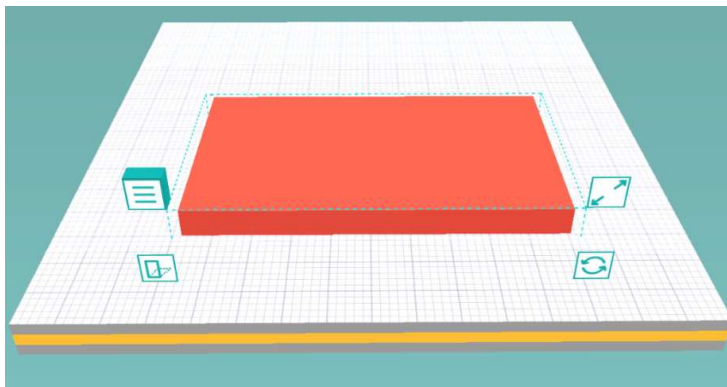
Lab



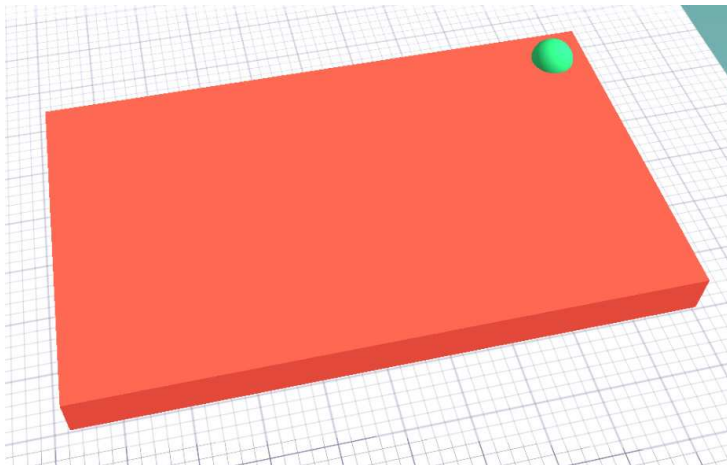
Now, you will use the 3D design software to create a model of the laptop. You will use shaper tools.

Use your 2D drawings to help you.

Start with a cuboid shape for the base of the laptop.



Use a sphere for the power button.



You have to use **three shaper tools or more** when creating your model.

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# Modelling with blocks in a 3D design software

## Difference between blocks and shapes in 3D design



### Activity 13



Theory

Fill in the spaces. Use the words from the table.

*curved*      *flat*      *Block*      *cannot*      *Shape*      *can*

\_\_\_\_\_ tools use cubes with \_\_\_\_\_ faces and edges. Blocks can be scaled but they \_\_\_\_\_ be stretched, skewed or cut. Blocks are best for 3D designs with flat edges.

\_\_\_\_\_ tools use many different shapes. Shapes can have \_\_\_\_\_ faces and edges. Shapes can be scaled, stretched and skewed. Shapes \_\_\_\_\_ be cut to make new shapes.



## Activity 14

Theory



Create 2D designs for a house.

Remember to add windows, doors and a roof.

Front view
End view

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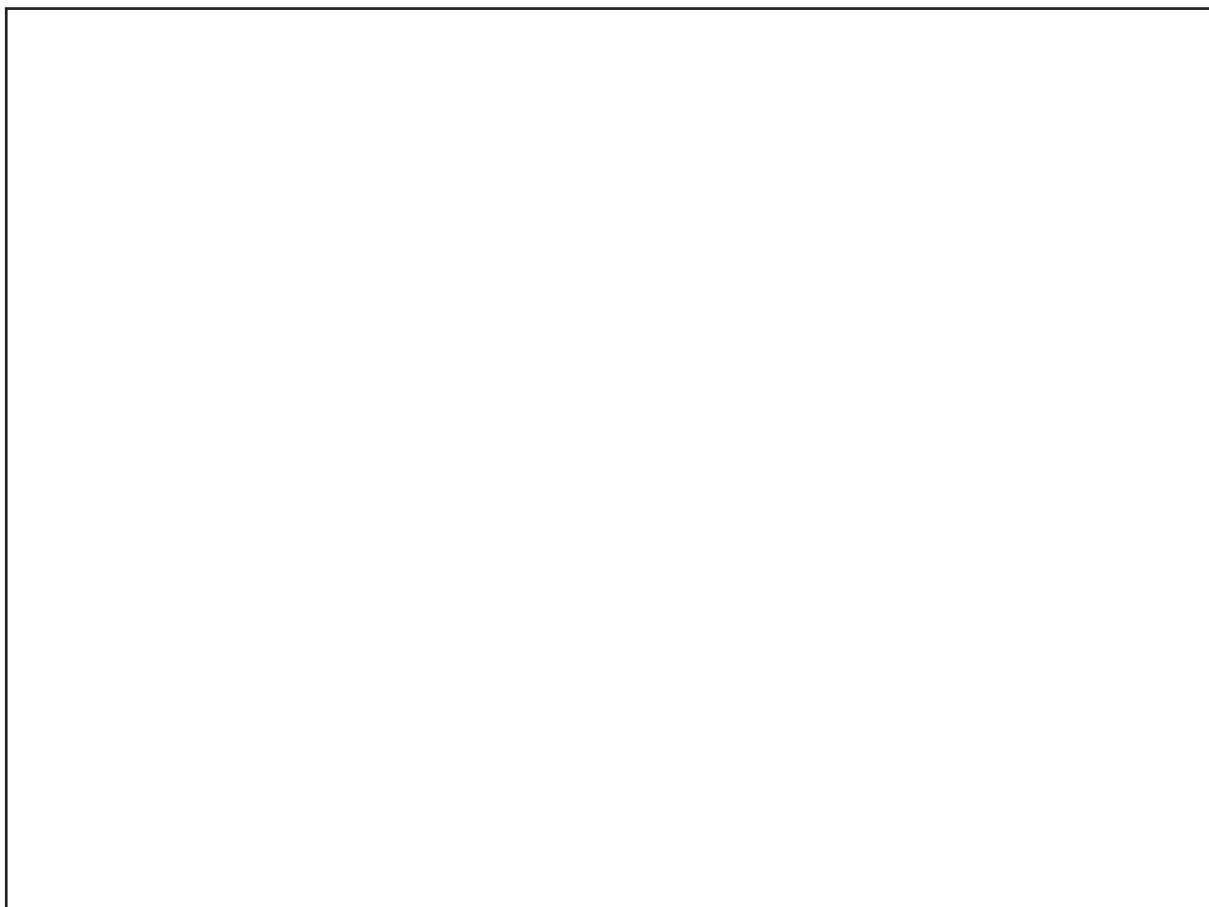
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# Activity 15

Theory

Now, create a 3D perspective drawing of your house. Later, you will make a 3D model using software (block tools).



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Sketching is a way to show someone the idea inside your mind.





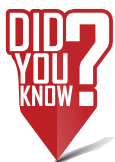
## Activity 16

Lab

You will use 3D design software. You will create a model of the house using block tools.

Use your designs to help you.

Remember to add windows, doors and a roof.



You use technology when you create models with 3D design software.

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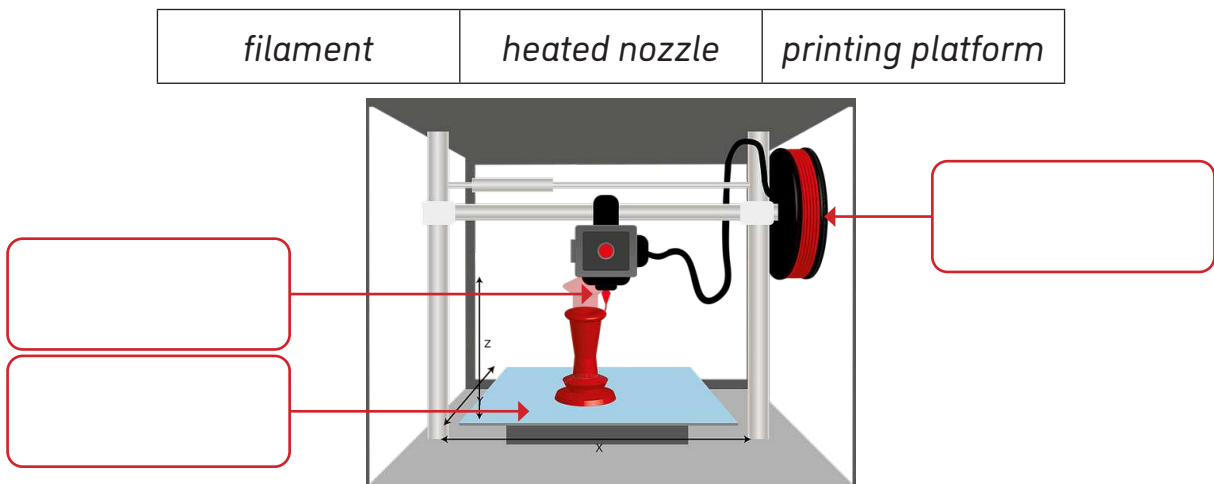
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# 3D printing

## How does 3D printing work?

### Activity 17 Interactive

Label the parts of the printer. Use the words below.



### Activity 18 Interactive

Fill in the blank spaces. Use the words from the table.

platform	software	desktop	filament	heated nozzle
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- The \_\_\_\_\_ creates your design from the file you sent to the computer. The computer is connected to the printer.
- The 3D printer uses a plastic string called a \_\_\_\_\_.
- The filament goes from a reel to a \_\_\_\_\_ inside the 3D printer.
- The melted filament is laid on the \_\_\_\_\_ as a layer.

# Artificial intelligence



Put the self-driving car steps in order for when an obstacle is detected.

	Slows down when the car senses a person in front.
	Car thinks about stopping, slowing down, or going around.
	Learns that an obstacle has to be avoided e.g. a car, a person or an object.



Complete the activity below by filling in the blanks.

*learn | agent | actions | models | decisions*

In AI, an \_\_\_\_\_ is something that can think and act on its own.

An agent can keep \_\_\_\_\_ of the world. The agent can then:

- Update the model using what they \_\_\_\_\_.
- Use the model to make \_\_\_\_\_.
- Carry out \_\_\_\_\_ based on the decisions.

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# Student reflection



## Activity 21



Write about what you have learned and enjoyed in this unit.




Three things I have learned:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Two things I have enjoyed:

1. \_\_\_\_\_
2. \_\_\_\_\_

## Knowledge and skills reflection

I CAN...			
describe the main features in a 3D design software e.g. canvas, view cube, etc.			
describe the tools used for 3D modelling. E.g. extrude, rotate etc.			
describe the differences between the Shaper Module and the Blocker module.			
<b>Teacher's comments:</b>			

# End of unit quiz



1. Write down one good thing about 3D design.

\_\_\_\_\_

2. The View Cube is used to \_\_\_\_\_.

- a. rotate the canvas and design.
- b. edit your design.
- c. add shapes to your canvas.

3. Write the name of three tools in Makers Empire.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

4. The Blocker tool uses \_\_\_\_\_.

- a. squares.
- b. blocks.
- c. shapes.

5. Which city has the first 3D-printed building?

- a. London
- b. Dubai
- c. New York

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