Fidget Spinner

Use Tinkercad blocks to create a fidget spinner with your own unique design. This is a print in place design for your 3D printer.

INTRODUCTION

What you will make

Design a fidget spinner that you can print on a 3D printer. This project will print in place.

What you will learn

• use coding blocks to design 3D objects

• joining shapes to make 1 solid shape

• adjusting values

What you will need

HARDWARE

A computer capable of running Tinkercad

SOFTWARE

Tinkercad - https://www.tinkercad.com/

Either an educator account or individual log ins are required
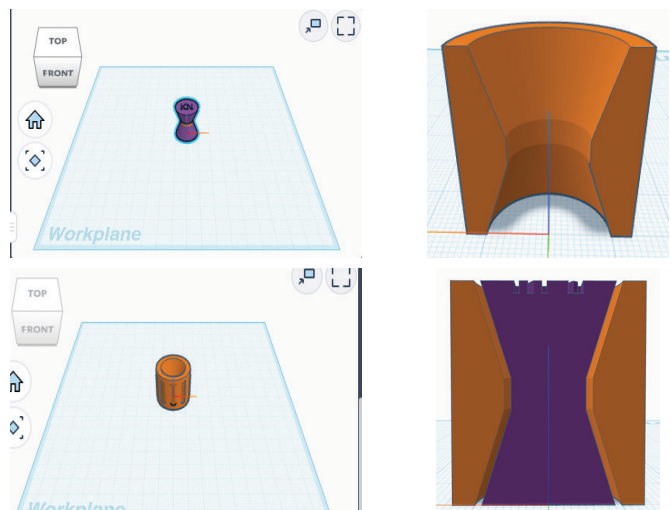
ADDITIONAL NOTES FOR EDUCATORS

Each fidget spinner is a print in place object. To print the project, click share and save a copy of the .stl file.

A fidget spinner, using the dimensions in the project, will use approximately 10g of filament and take 30 minutes to print.

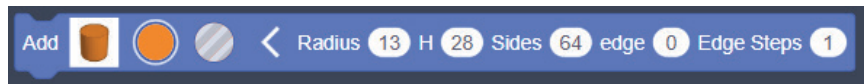The design is made of 2 pieces, created by joining cylinders and cones.

Page 1

1. CREATING THE OUTSIDE
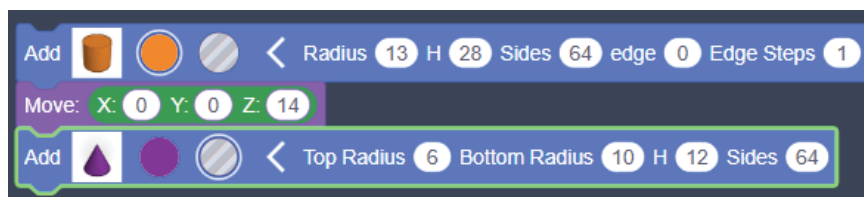
In Tinkercad click Create. Select Codeblocks.

From the shapes menu add a cylinder block. Make sure the solid colour circle is highlighted. Click the arrow at the end to expand the block and adjust the meaurements as shown.
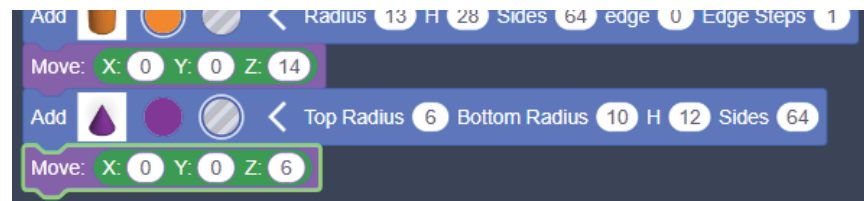
> Add ▮ 🟠 ◑ ‹ Radius 13 H 28 Sides 64 edge 0 Edge Steps 1

Next add a move block from the modify menu. Adjust the z coordinate. Click the play button to see your cylinder.

> Add ▮ 🟠 ◑ ‹ Radius 13 H 28 Sides 64 edge 0 Edge Steps 1
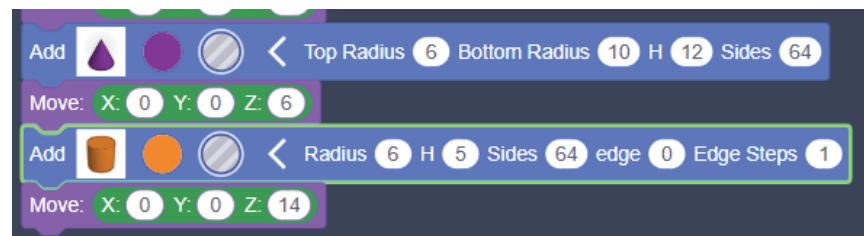> Move: X: 0 Y: 0 Z: 14
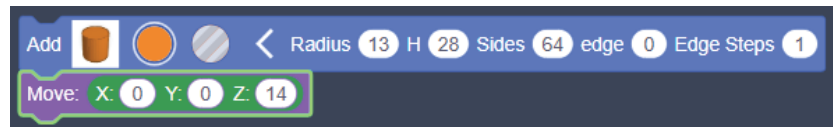
Next we need to create the inside of the fidget spinner by creating a certain shaped hole. Add a cone shape and **select the hole circle** (grey diagonal lines). Adjust the measurements.
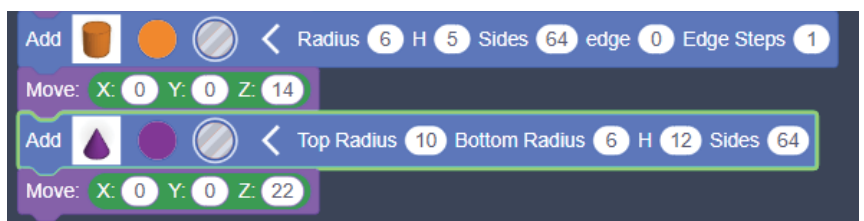
> Add ▮ 🟠 ◑ ‹ Radius 13 H 28 Sides 64 edge 0 Edge Steps 1
> Move: X: 0 Y: 0 Z: 14
> Add 🔻 🟣 ◑ ‹ Top Radius 6 Bottom Radius 10 H 12 Sides 64

Add a move block to specify the location of the cone hole. It will sit at the bottom of the shape.

> Add ... ‹ Radius 13 H 28 Sides 64 edge 0 Edge Steps 1
> Move: X: 0 Y: 0 Z: 14
> Add 🔻 🟣 ◑ ‹ Top Radius 6 Bottom Radius 10 H 12 Sides 64
> Move: X: 0 Y: 0 Z: 6

Add a cylinder shape and make it a hole. Adjust the dimensions. This will sit on top of the cone shaped hole. Then add a move block to set its location.

> Add 🔻 🟣 ◑ ‹ Top Radius 6 Bottom Radius 10 H 12 Sides 64
> Move: X: 0 Y: 0 Z: 6
> Add ▮ 🟠 ◑ ‹ Radius 6 H 5 Sides 64 edge 0 Edge Steps 1
> Move: X: 0 Y: 0 Z: 14

Add the final inside hole, another cone. Remember to set it as a hole and adjust its measurements. Then add the move block to set its location.

> Add ▮ 🟠 ◑ ‹ Radius 6 H 5 Sides 64 edge 0 Edge Steps 1
> Move: X: 0 Y: 0 Z: 14
> Add 🔻 🟣 ◑ ‹ Top Radius 10 Bottom Radius 6 H 12 Sides 64
> Move: X: 0 Y: 0 Z: 22

Add a group selection block to join these 4 shapes together as a whole shape. Click play to see your shape build.

> Move: X: 0 Y: 0 Z: 14
> Add 🔻 🟣 ◑ ‹ Top Radius 10 Bottom Radius 6 H 12 Sides 64
> Move: X: 0 Y: 0 Z: 22
> Group Selection 🌈 ◑

Extension task

Create a pattern for the outside of your fidget spinner.

From the control menu add a count with block and change the name to pattern. This will create a loop that repeats 10 times.

From the shapes menu add a box block. Make sure it is set as a 'hole'. Adjust the measurements. This will make a rectangle shape that will stretch between the top and bottom of the fidget spinner.
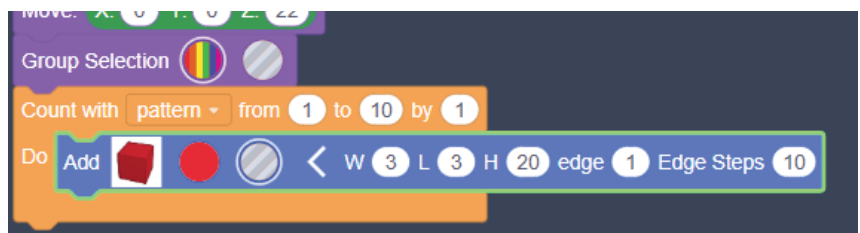
Add a move block to set its location on the outside of the fidget spinner. Run your program. It will place all 10 rectanges in the same place.
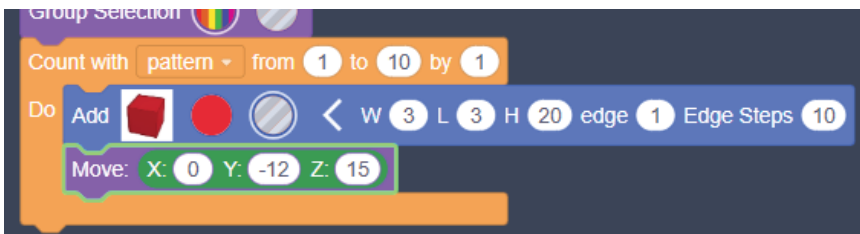
To rotate the 10 shapes around the outside of the fidget spinner add a rotate around block, from the modify menu. Select axis z.
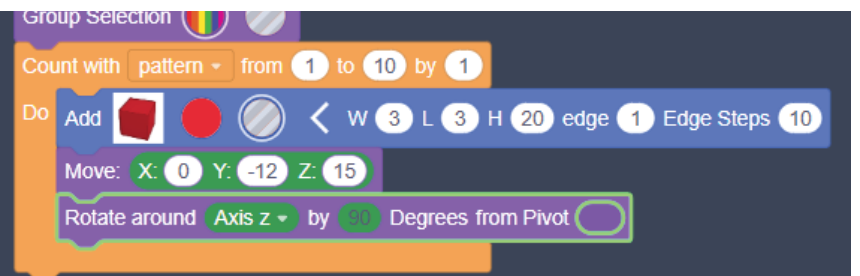
From the math menu add the sum block. The operator block should read 36 * (multiply) by pattern (variable menu). In degrees from pivot add the x y z block from the math menu. Click play to see your pattern!
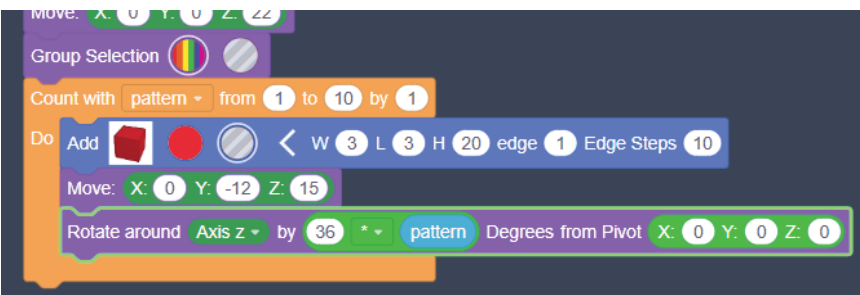
Finally, add a group selection block to lock your pattern to the outside of the fidget spinner.
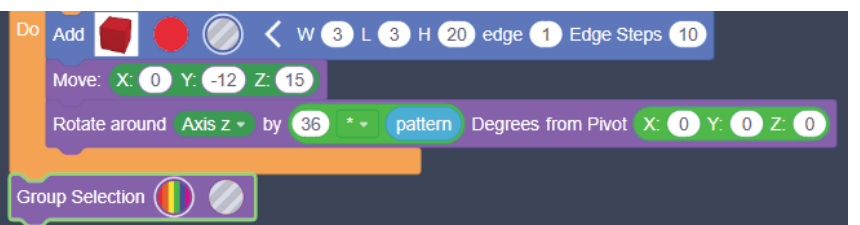
Adjust the measurements in your pattern to create you own design. Make small changes to the width, length, height or edge to see what happens. Remember to make one change at a time so you can see what works best.

Page 3

From the shapes menu add a cone block. Make sure the solid colour circle is highlighted. Click the arrow at the end to expand the block and adjust the meaurements as shown.
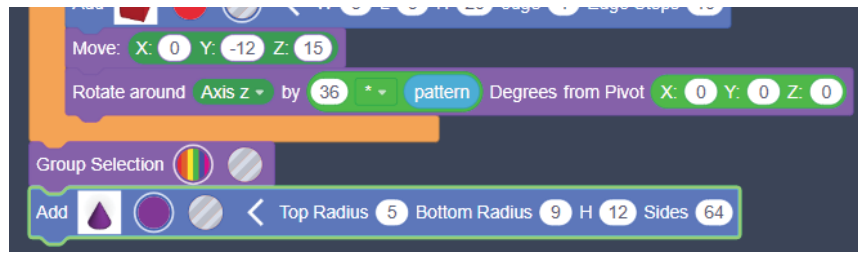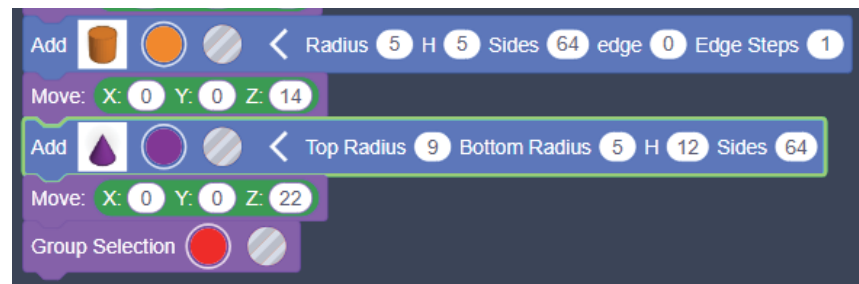
From the modify menu add a move block to place the shape inside the fidget spinner.
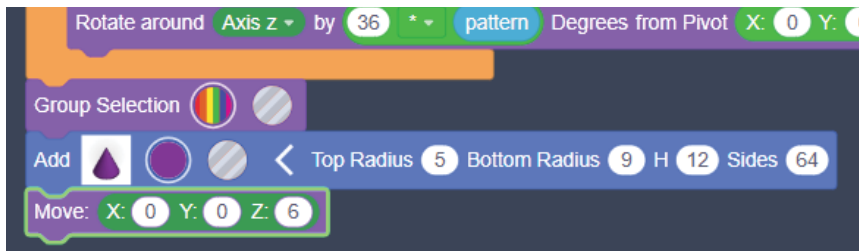
From the shapes menu add a cylinder block. This will go on top of the cone. Set it's measurements as shown. Then add a move block to place the cylinder on top of the cone shape.
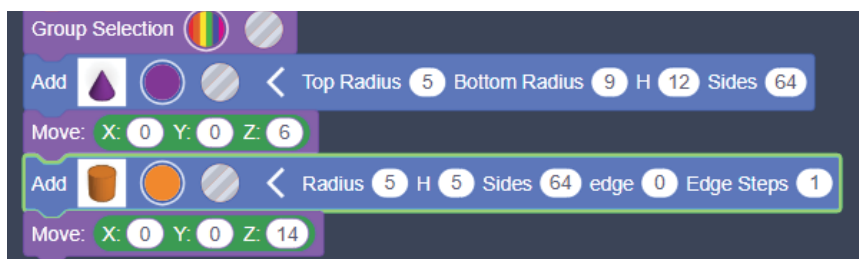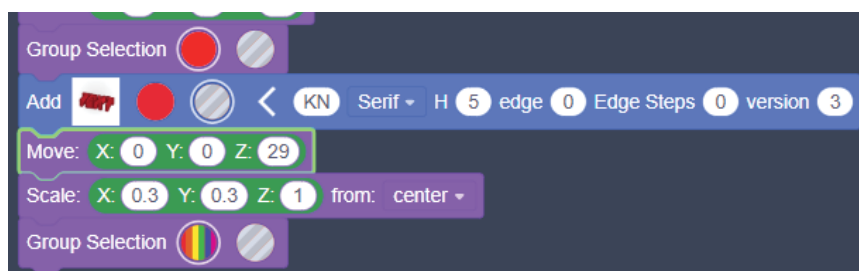
The final shape to add is another cone. Adjust its measurements and then add a move block to set it on top.

Then add a group selection to lock these together as one piece.
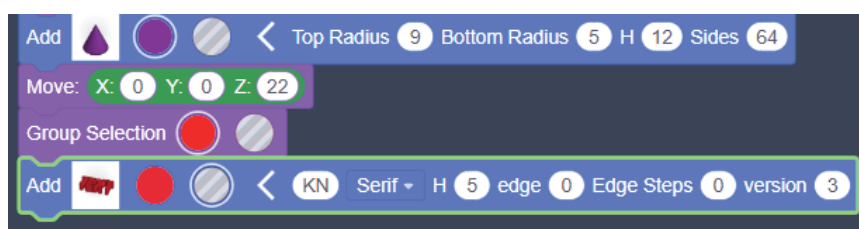
The final step, add your initials to the top of your fidget spinner. Add a text block and set it to be a hole. Replace the word TEXT with your initials. You can personalise the font type.

Add a move block to set the location of the text. Then add a scale block to shrink it to size. Finally add a group selection block to set the initials into the fidget spinner.