

## Lesson 8: Planning your design

### Objectives:

1. Choose a design to replicate or adapt in Fusion 360.
2. Produce plans in the form of technical sketches with dimensions of a prototype.

# PROJECT BRIEF



### Project Name:

Mycelium design challenge

### Project goals and objectives:

Create a fully compostable desk organizer out of mycelium.

### Target market:

Environmentally-conscious students and working professionals who need to store desk supplies.

### Key project deliverables:

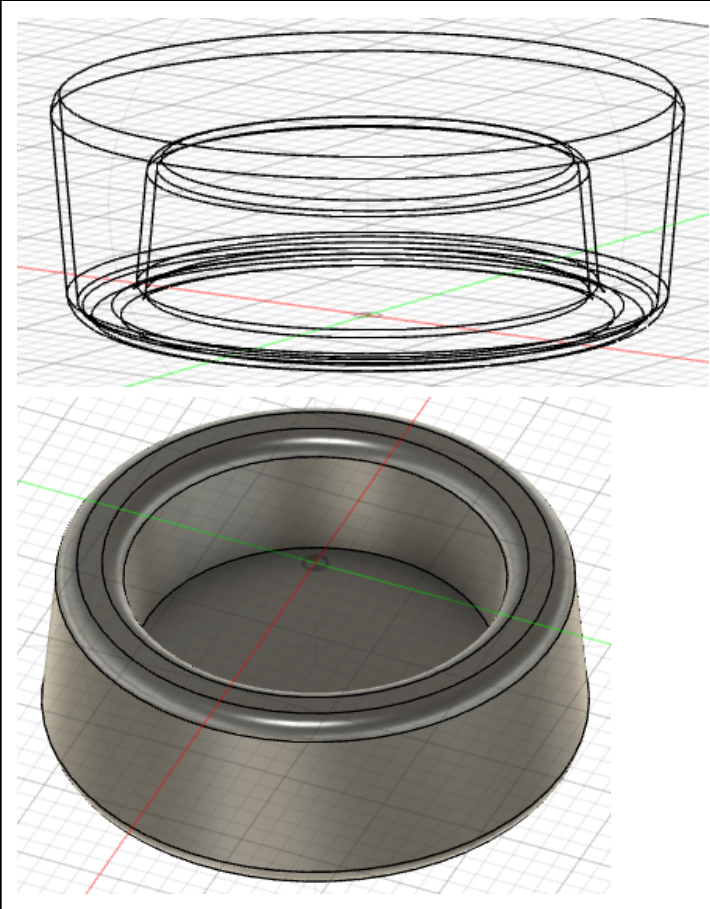
- Design and 3D print a mold for a tabletop desk organizer using Fusion 360.
- The desk organizer will be grown from mycelium using the mold and grow kit.

### Constraints:

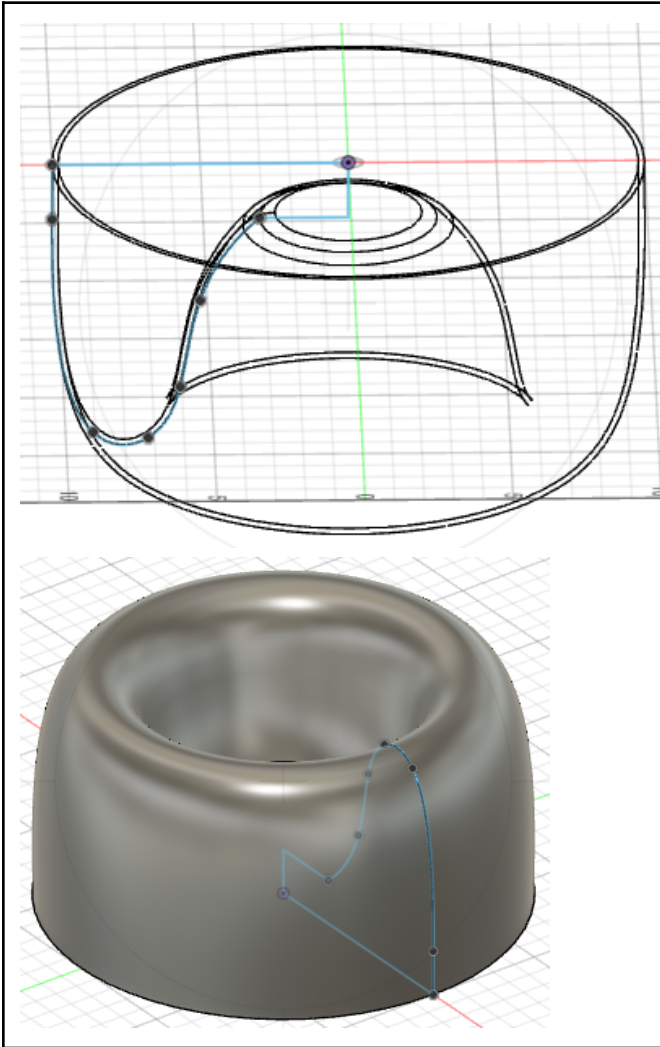
- Mold must have a 4 mm fillet minimum radius
- Mold must have a 10 mm minimum wall thickness
- Mold must have vertical walls with at least 3° draft angles.
- Mold must plan for shrinkage of mycelium: 4% in the X and Y directions, and 7% in the Z direction.
- Desk organizer must sit flat on top of a desk and be able to hold simple office supplies.

1. Choose one of the following general designs for guidance:

A. Circle dish

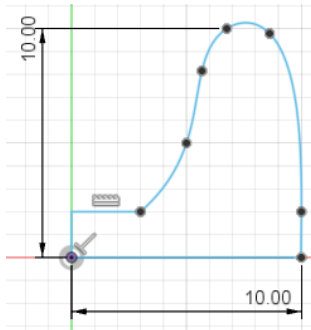
	<p><b>General tips:</b> Start out by creating 2 sketches of concentric circles along the XY plane. Extrude the whole sketch to give it height. Then extrude the inside circle with the “cut” feature to carve out the center. Shell to make the form hollow. Fillet all corners to provide a more rounded structure.</p> <p>Tip for fillets: “Corner type: rolling balls” works well for exteriors, while “Corner type: setback” works well for interiors.</p>
---	--

B. Organic dish



**General tips:**

Create a sketch along the XZ plane and originating at the 0,0 axis. It should be straight on the bottom, and create the curvature of the side of the dish. Use a “fit point spline” line in order to produce a smoothly curved design. In this step you’ll also set the radius and height of the dish.

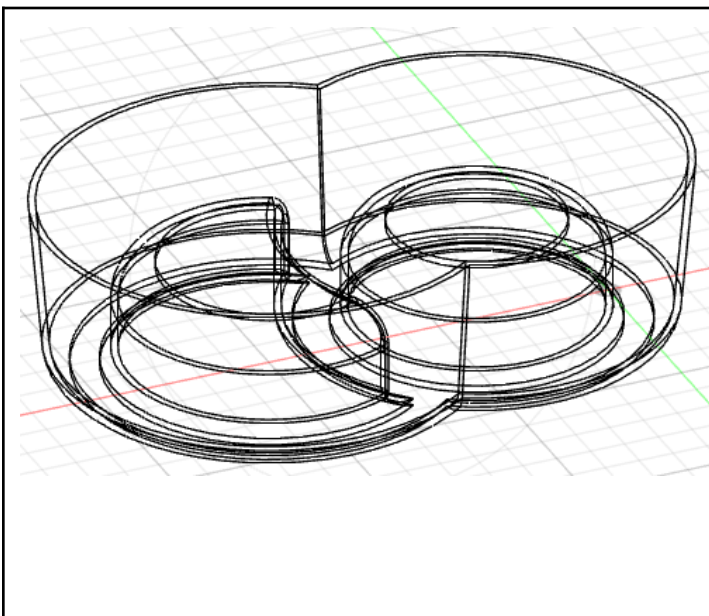


Use the Revolve tool to do a ‘full revolve’, creating a 360° round dish. Shell the design to make it hollow. Fillet the edges of the interior of the dish to make rounded edges.

**Tip for fillets:**

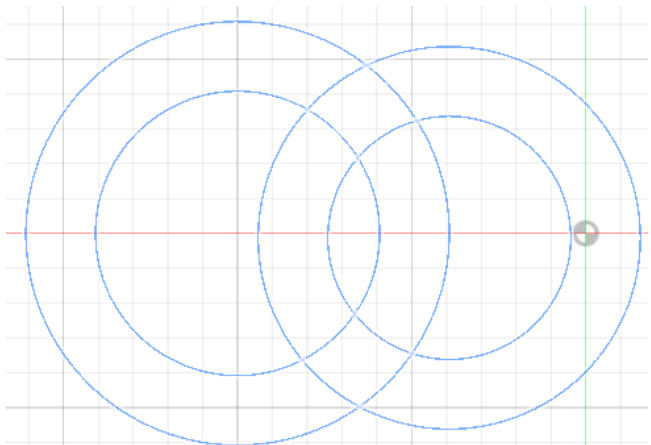
“Corner type: rolling balls” works well for exteriors, while “Corner type: setback” works well for interiors.

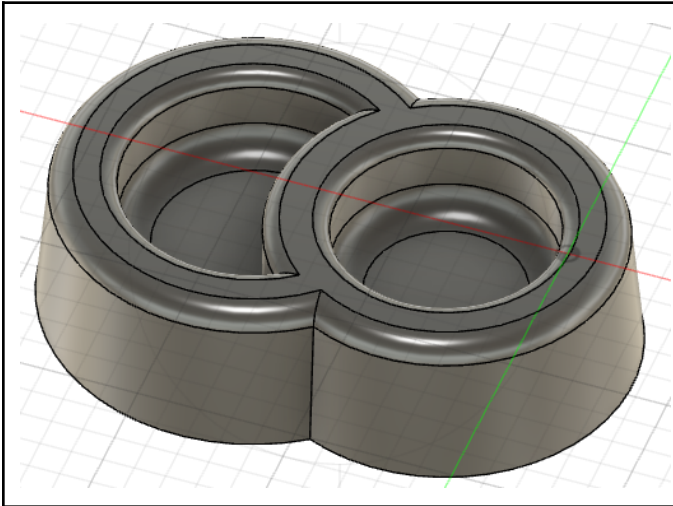
**C. Double dish**



**General tips:**

Start out by creating 2 sketches of 2 concentric circles along the XY plane. They should overlap as seen below.

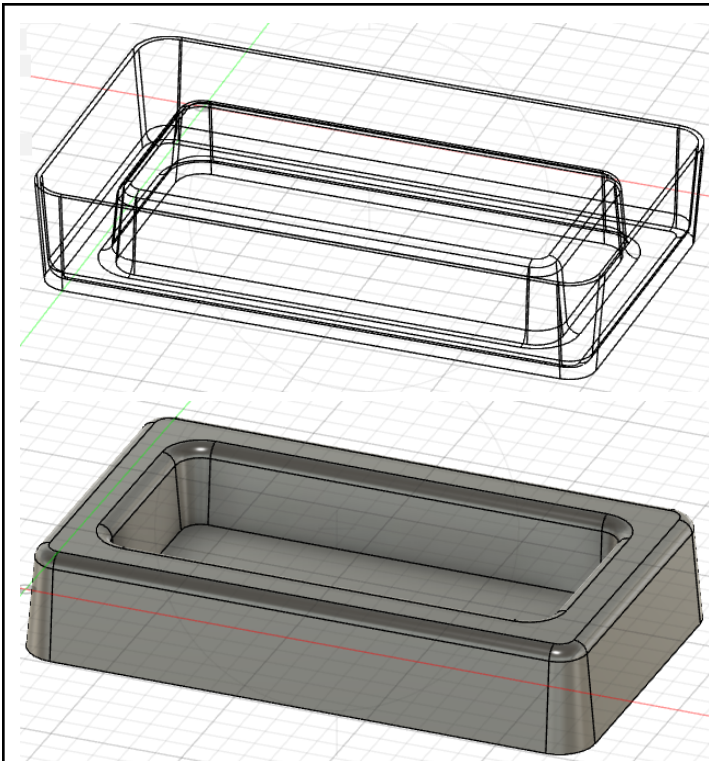




Extrude the whole sketch to give it height.  
Then extrude the inside circles with the “cut” feature to carve out the inside.  
Shell to make the form hollow.  
Fillet all corners to provide a more rounded structure.

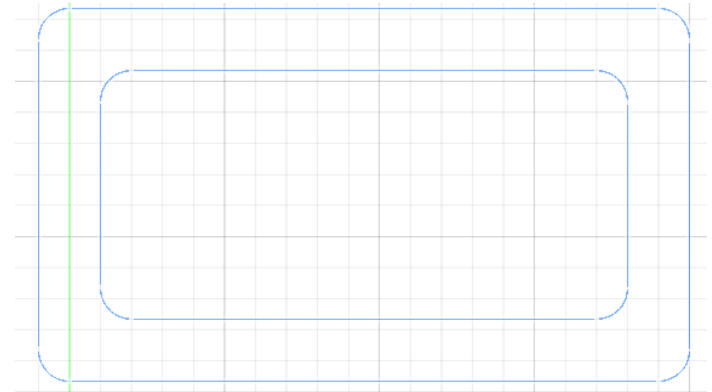
Tip for fillets:  
“Corner type: rolling balls” works well for exteriors,  
while “Corner type: setback” works well for interiors.

#### D. Tray



#### General tips:

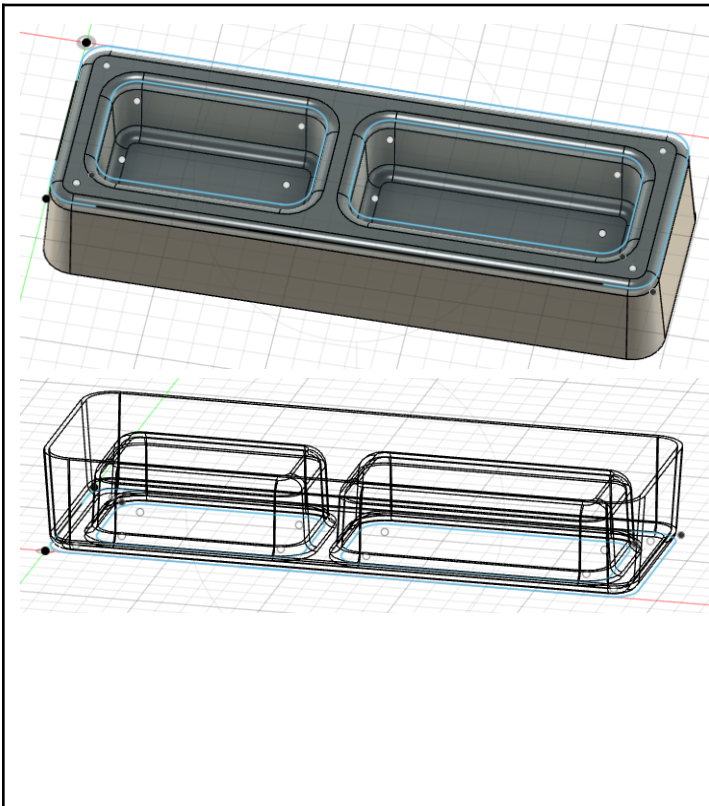
Start out by creating 2 rectangles along the XY plane.  
Use the fillet sketch tool to fillet the corners of both rectangles.



Extrude the whole sketch to give it height.  
Then extrude the inside rectangle with the “cut” feature to carve out the center.  
Shell to make the form hollow.  
Fillet all corners to provide a more rounded structure.

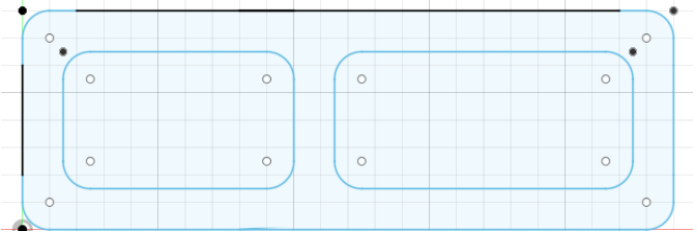
Tip for fillets:  
“Corner type: rolling balls” works well for exteriors,  
while “Corner type: setback” works well for interiors.

## E. Double tray



### General tips:

Start out by creating a sketch similar to the one below, along the XY plane. Use the fillet sketch tool to fillet the corners of all three rectangles.



Extrude the whole sketch to give it height. Then extrude the inside 2 rectangles with the “cut” feature to carve out space in both. Shell to make the form hollow. Fillet all corners to provide a more rounded structure.

### Tip for fillets:

“Corner type: rolling balls” works well for exteriors, while “Corner type: setback” works well for interiors.

## 2. Create the prototype:

- A. Consider what style of design you may want to build. Create some simple concept sketches to help you brainstorm.
- B. When you are ready with a final idea selected, draw a multiview sketch with dimensions of the prototype you will make.
- C. Use your multiview sketch to help check that you are following all constraint considerations from Lesson 7.
- D. Begin building your prototype on Fusion 360. Your design may change further as you design on Fusion, and that is okay! This is part of the ideation process.