BMES CELL TEAM

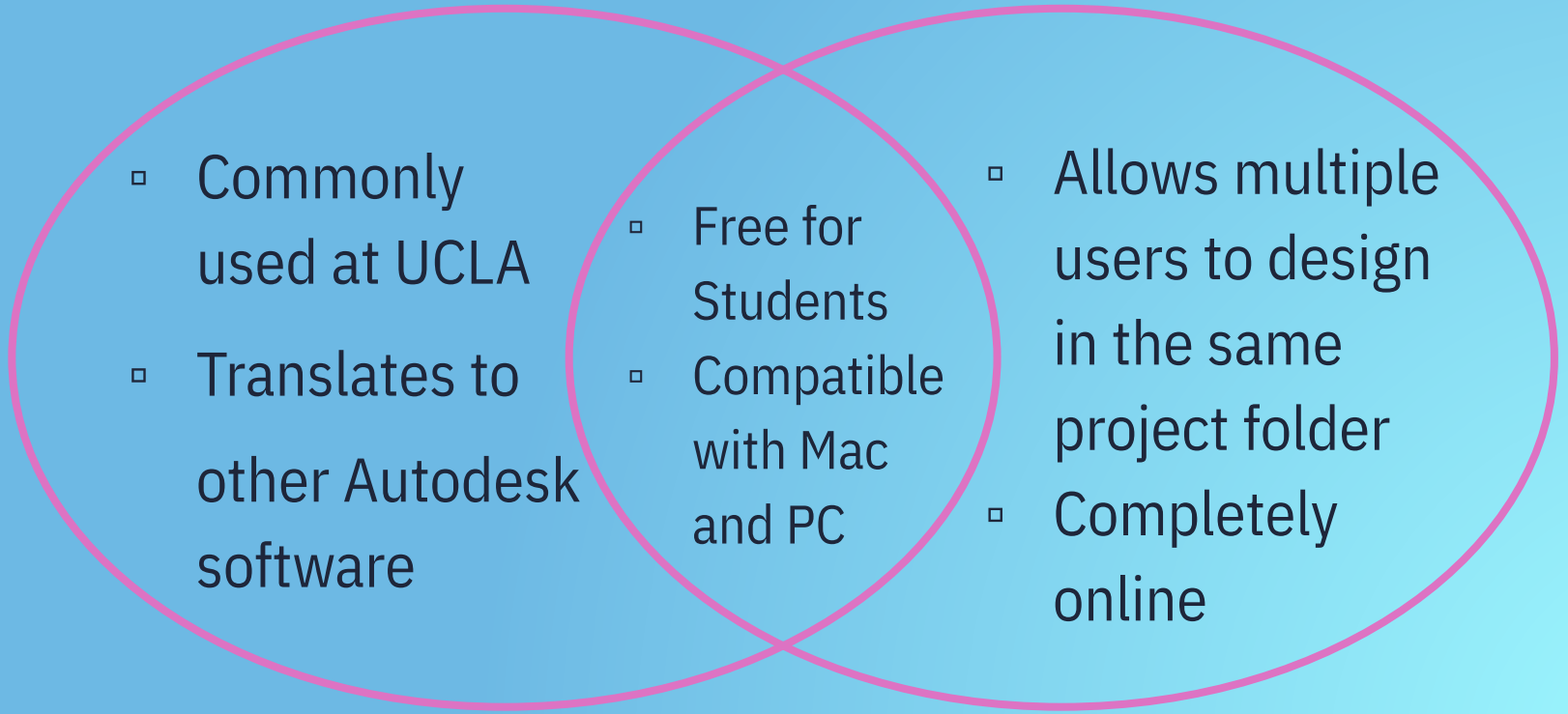
CAD OFFICE HOURS

OUTLINE

- **Autodesk Fusion 360**
  - Basic Setup
  - Some Useful Commands
- **OnShape**
  - Basic Setup
  - Working with Multiple Designers
- **Questions / Help with Design**

* Some Slides Taken from Previous 3D4E & Tech Projects Presentations

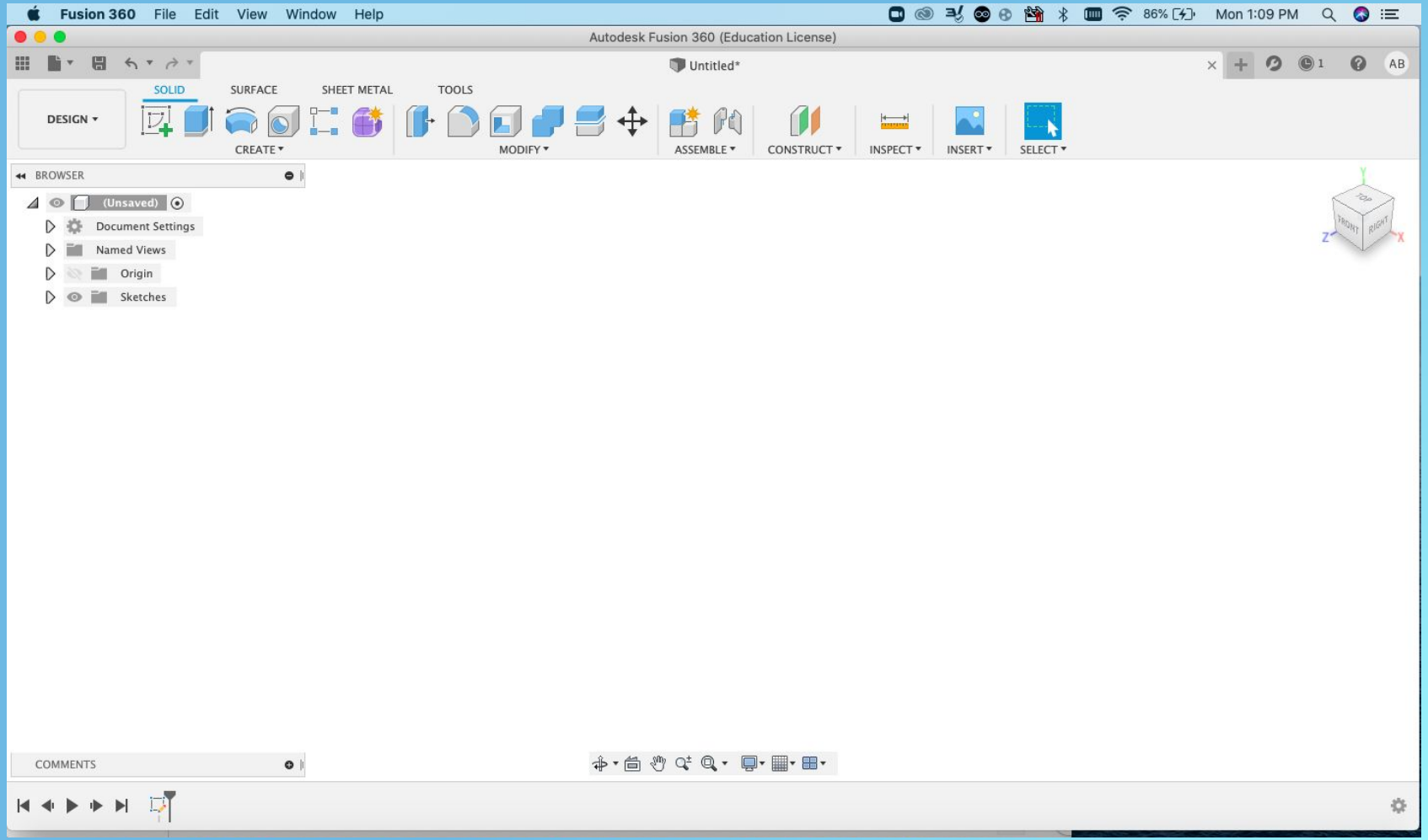
FUSION 360 VERSUS ONSHAPE



HOW TO GET THE SOFTWARE

- **Autodesk Fusion 360**
  - **https://www.autodesk.com/education/edu-software/overview?sorting=featured&page=1&filters=individual&search=FUSION**
  - Make an account with your student email and download Fusion 360 for your OS
- **OnShape**
  - **https://www.onshape.com/en/products/free**
  - Click “Get Started” to make an account

FUSION 360 BASICS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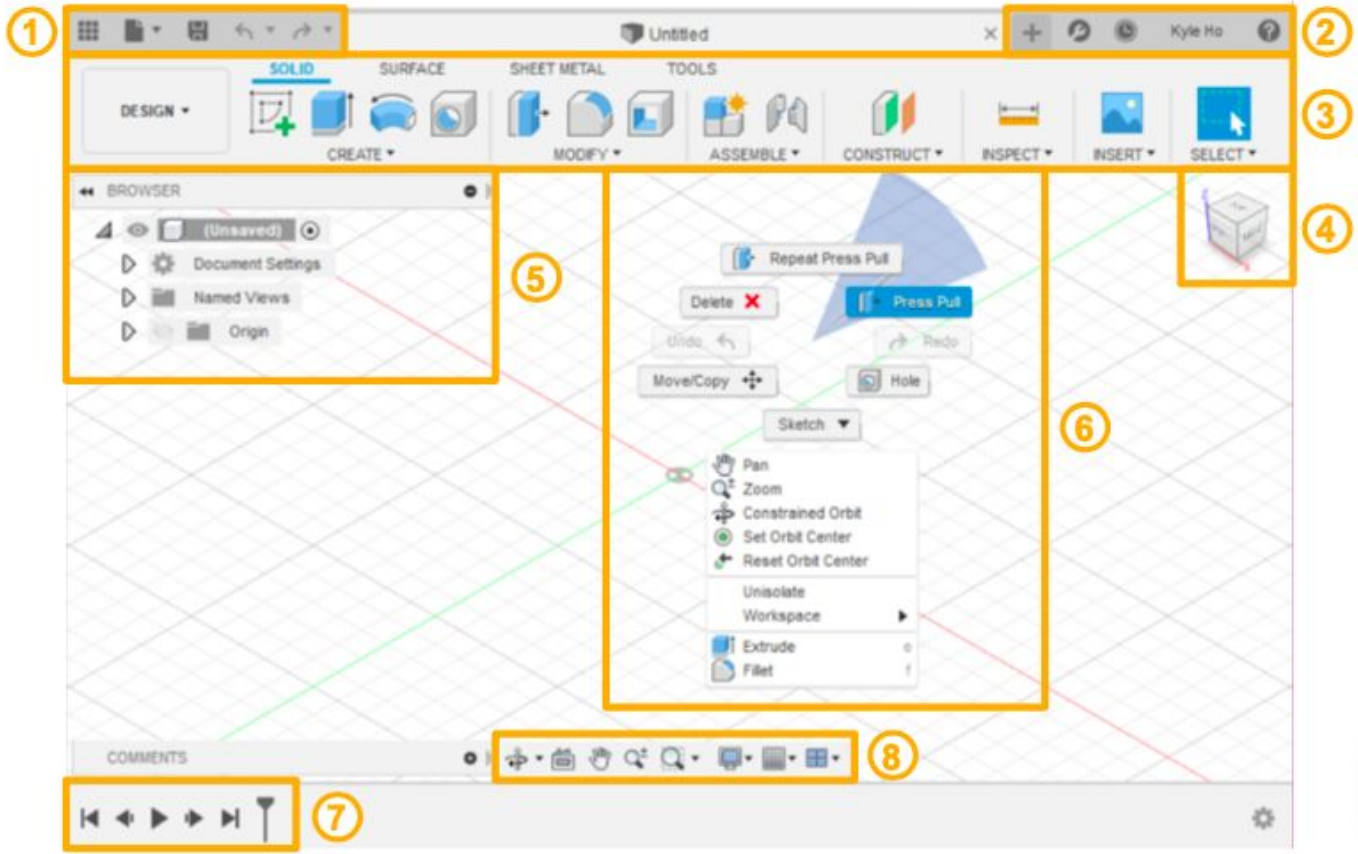
Named Views
Origin
Sketches
COMMENTS

The UI can be broken up into 8 different sections:



1 Application bar

The Application bar is where you'll find and use the following:

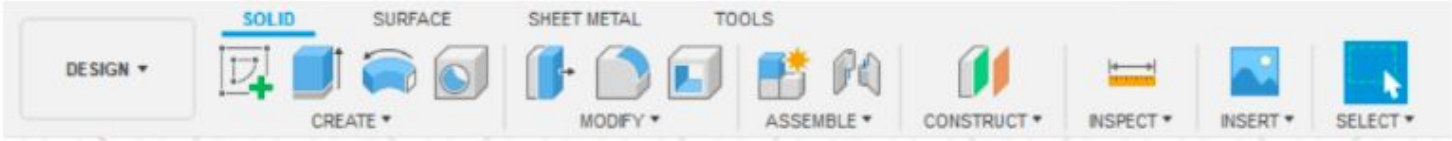
	**Data Panel** – Used for data management and collaboration.
	**File** – Create a New Design, Save, Export, and 3D Print.
	**Save** – Save an untitled design or save the changes to a design as a new version.
	**Undo/redo** – Undo/redo operations.

2

Profile and help

In profile you can control your profile and account settings, or use the help menu to continue your learning or get help in troubleshooting.

	Profile – In your profile you can access your own personal settings.
	**Help** – In the help menu you can access online learning content, help, forums, step-by-step tutorials, or link to community content.

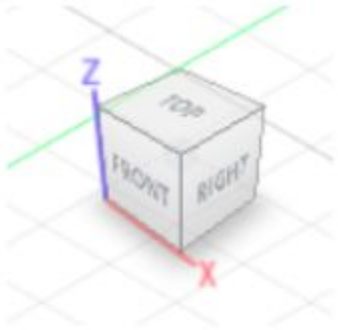


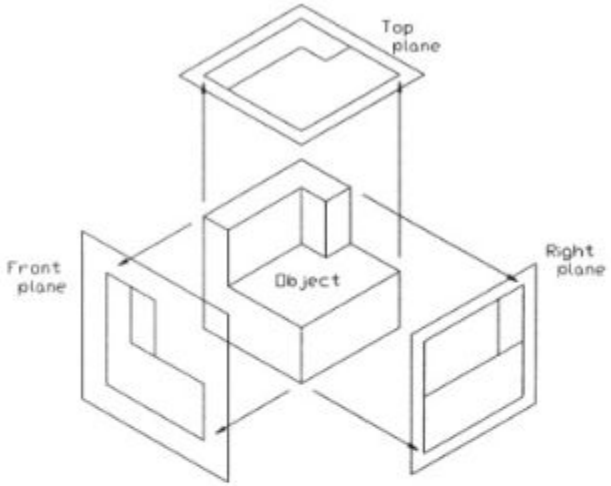
3

Toolbar

Use the Tool bar to select the workspace you want to work in, and the tool you want to use in the workspace selected.

SCULPT	The Sculpt workspace is used to create organic shapes by manipulating faces, edges, and vertices.
MODEL	The Model workspace is used to create solids with hard edges and flat faces.
PATCH	The Patch workspace is used to create open surfaces to stitch into solid bodies.
RENDER	The Render workspace is used to set up the environment and creat photo-realistic renderings.
CAM	The CAM workspace is used to create and simulate tool-paths then generate g code for subtractive manufacturing.
ANIMATION	The Animation workspace is used for to create exploded views of an assembly and control over unique animations of parts and assemblies.
	The Drawing workspace is used to generate 2D manufacturing drawings.

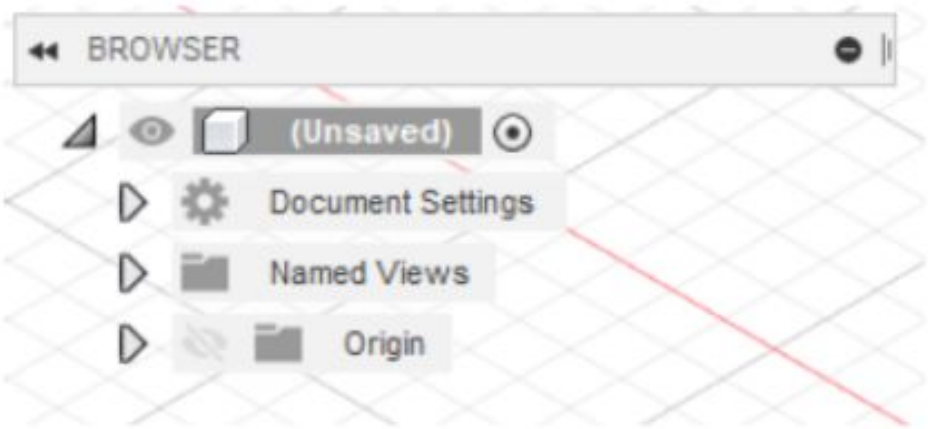




4

ViewCube

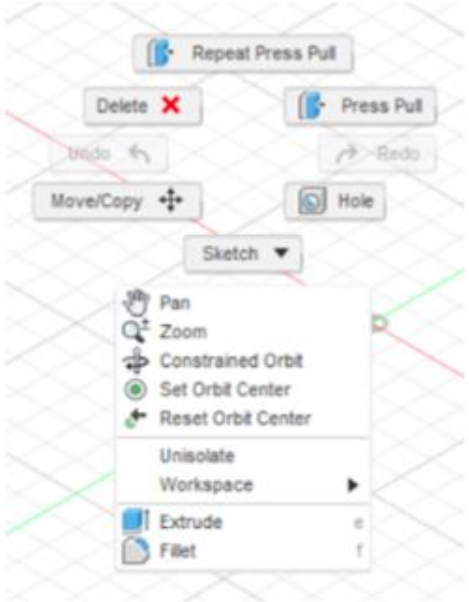
Use the ViewCube to orbit your design or view the design from standard view positions.



5

Browser

The browser lists objects in your design. Use the browser to make changes to objects and control visibility of objects.



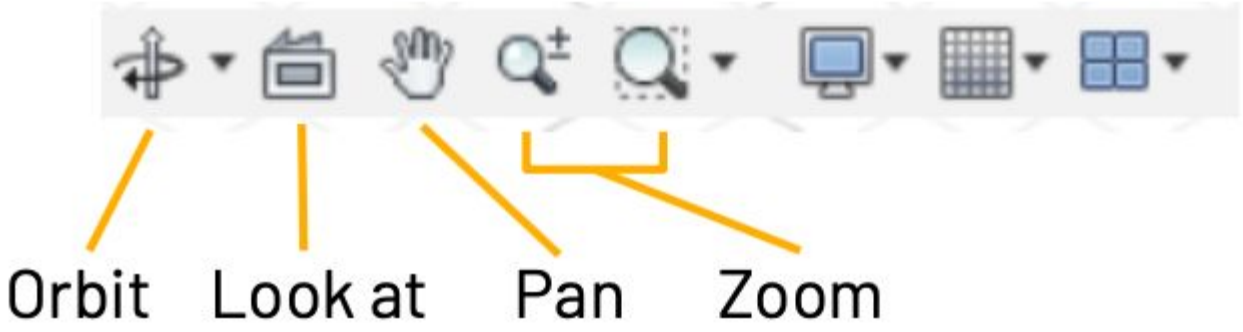
6

Canvas and marking menu

Left click to select objects in the canvas. Right-click to access the marking menu. The marking menu contains frequently used commands in the wheel and all commands in the overflow menu.

Timeline

7 The timeline lists operations performed on your design. Right-click operations in the timeline to make changes. Drag operations to change the order they are calculated.



Navigation bar and display settings

8 The navigation bar contains commands used to zoom, pan, and orbit your design. The display settings control the appearance of the interface and how designs are displayed in canvas.

There are three ways to manipulate the view of your design:

1. Navigation bar

2. ViewCube

3. Middle mouse button

Mouse

Use mouse shortcuts to zoom in/out, pan the view, and orbit the view.

	**Scroll middle mouse button** to **zoom in or zoom out**.
	**Click and hold middle mouse button** to **pan the view**.
SHIFT + 	**Shift Key + middle mouse button** to **orbit the view**.

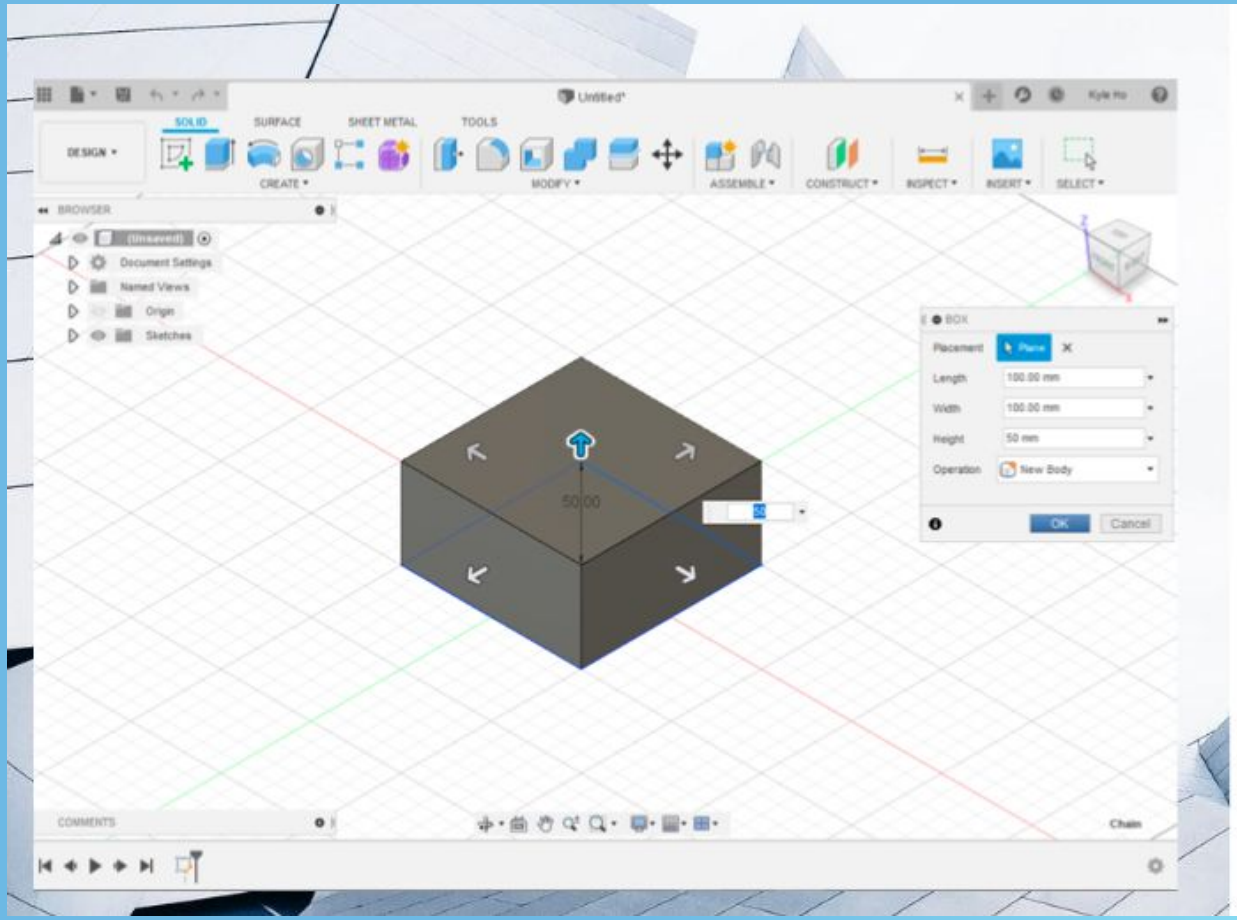
Mac Trackpad

	Use the **2 finger pinch** to **zoom out**.
	Use the **2 finger spread** to **zoom in**.
	Use the **2 finger swipe** to **pan the view**
	**Hold Shift + the 2 finger swipe** to **orbit the view**

FUSION 360 WALKTHROUGH

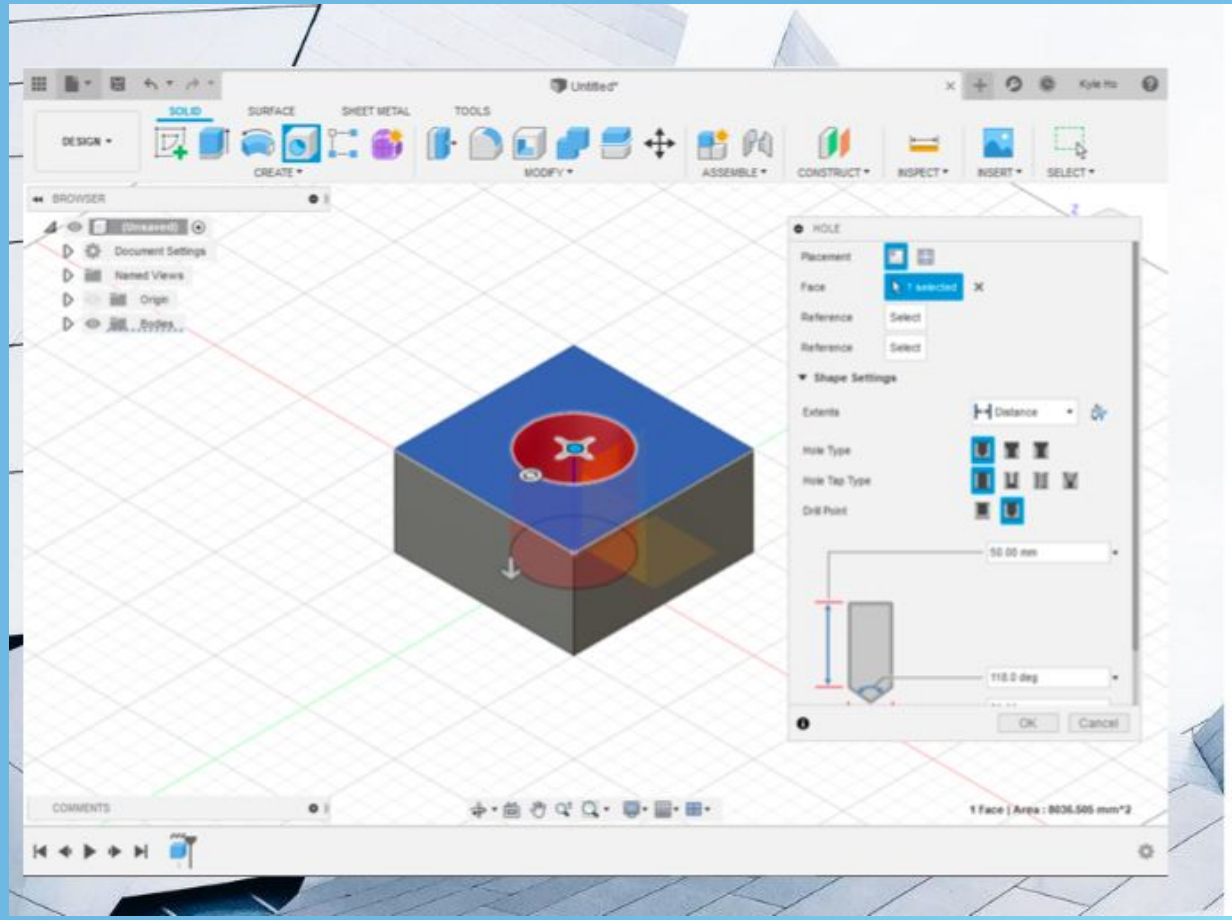
COMMANDS WE WILL GO OVER

- **Box** (can also be done with Extrude)
- **Hole** (can also be done with Extruded Cut)
- **Press Pull** (can also be done with Filet)



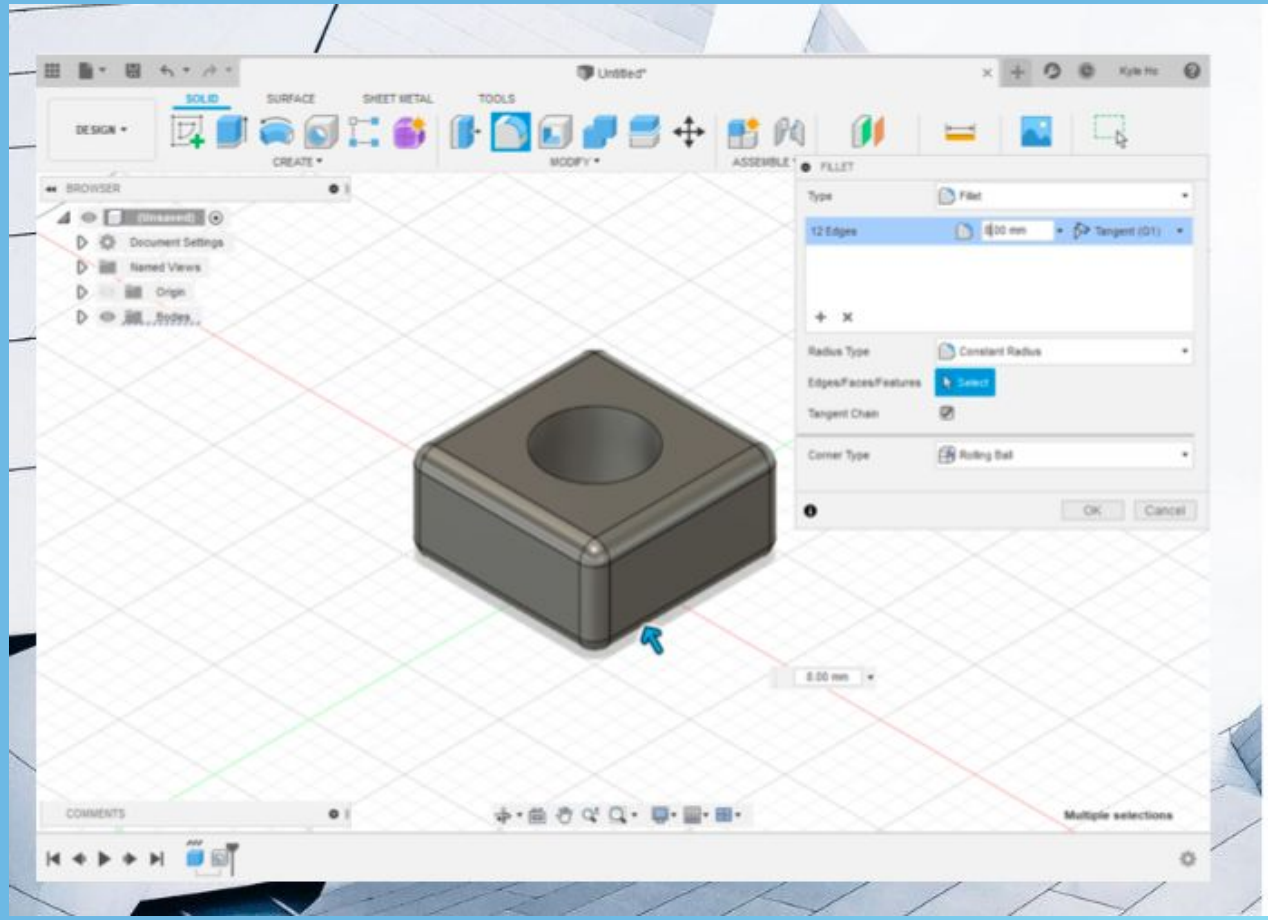
Step 1: Create a box

1. Click **Model** > **Create** > **Box** to start the box command
1. Select the **XY** plane along the bottom of the canvas
1. Pick two points to define the **length** and **width** of the box.
1. In the box dialogue, use:
   Length: **100 mm**
   Width: **100 mm**
   Height: **50 mm**
5. Click **OK.**



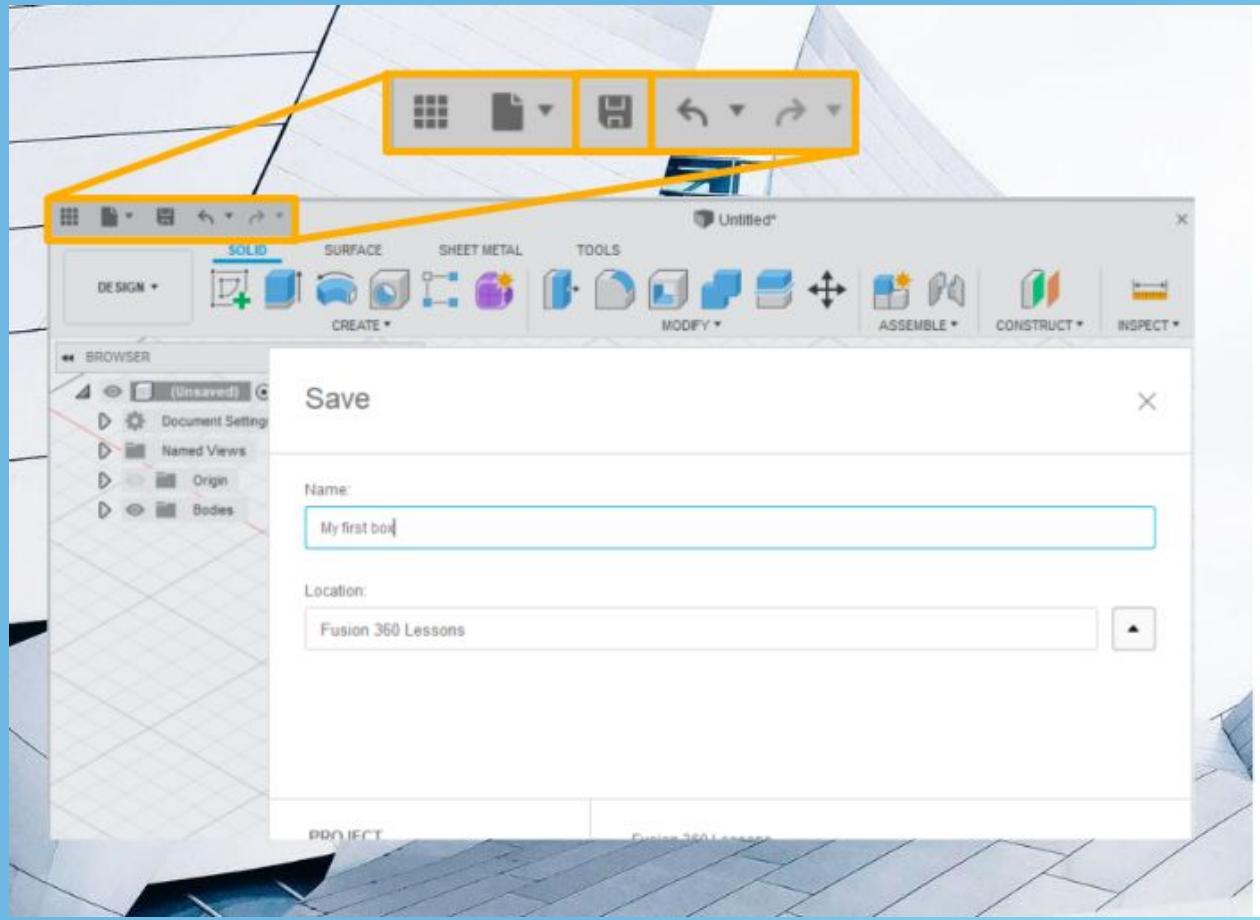
Step 2: Add a hole to the box

1. Click **Model** > **Create** > **Hole** to start the hole command
1. Select the **top face** of the box.
1. Snap the hole to the centre of the box by dragging it.
1. Set the diameter to **50 mm**
5. Change Extents to **All**
6. Click **OK.**



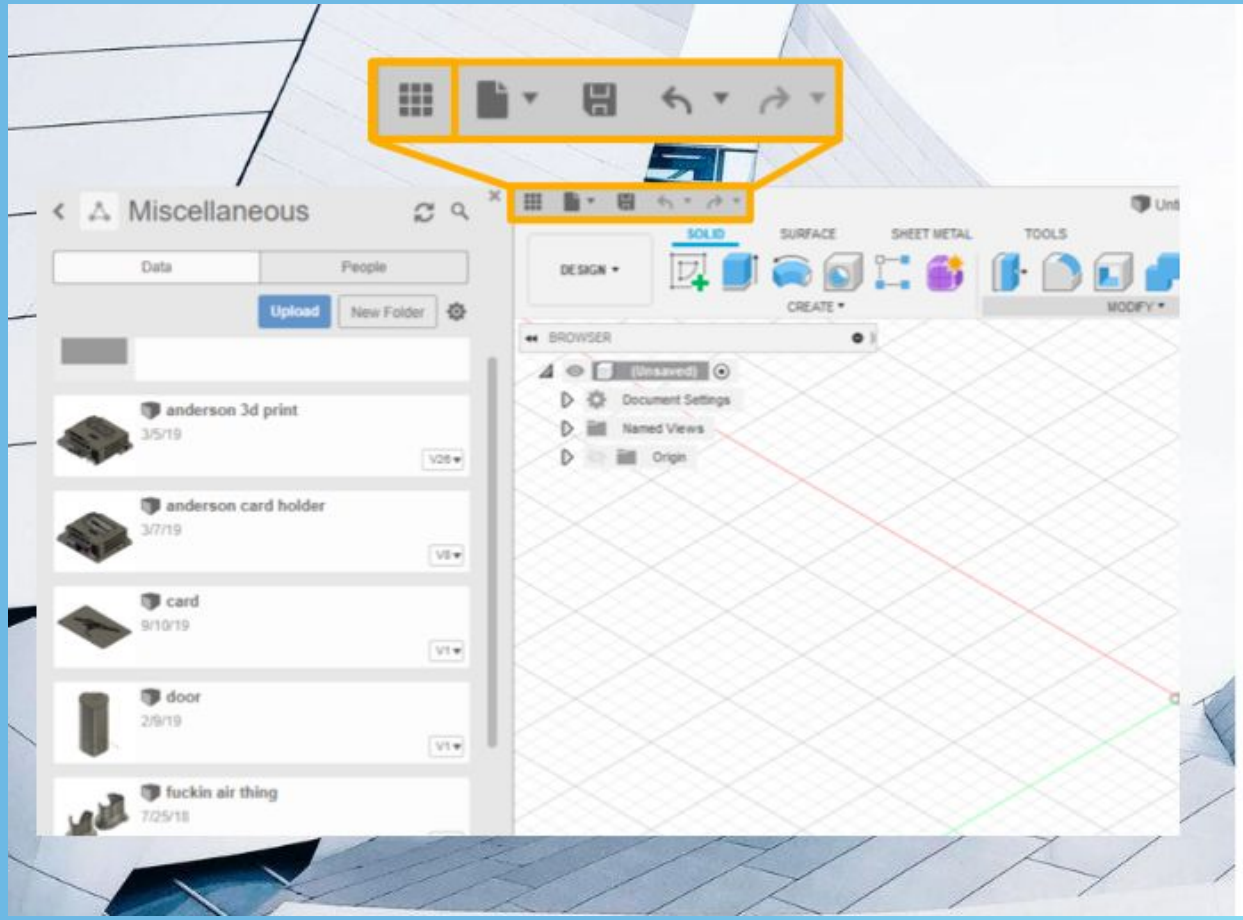
Step 3: Round the edges

1. Right-click an empty area on the canvas and select **Press Pull**
1. Hold left-click and drag to **window select** the entire box
1. Click the edges of the hole (top and bottom) to deselect
1. Set radius to **8 mm**
5. Click **OK.**



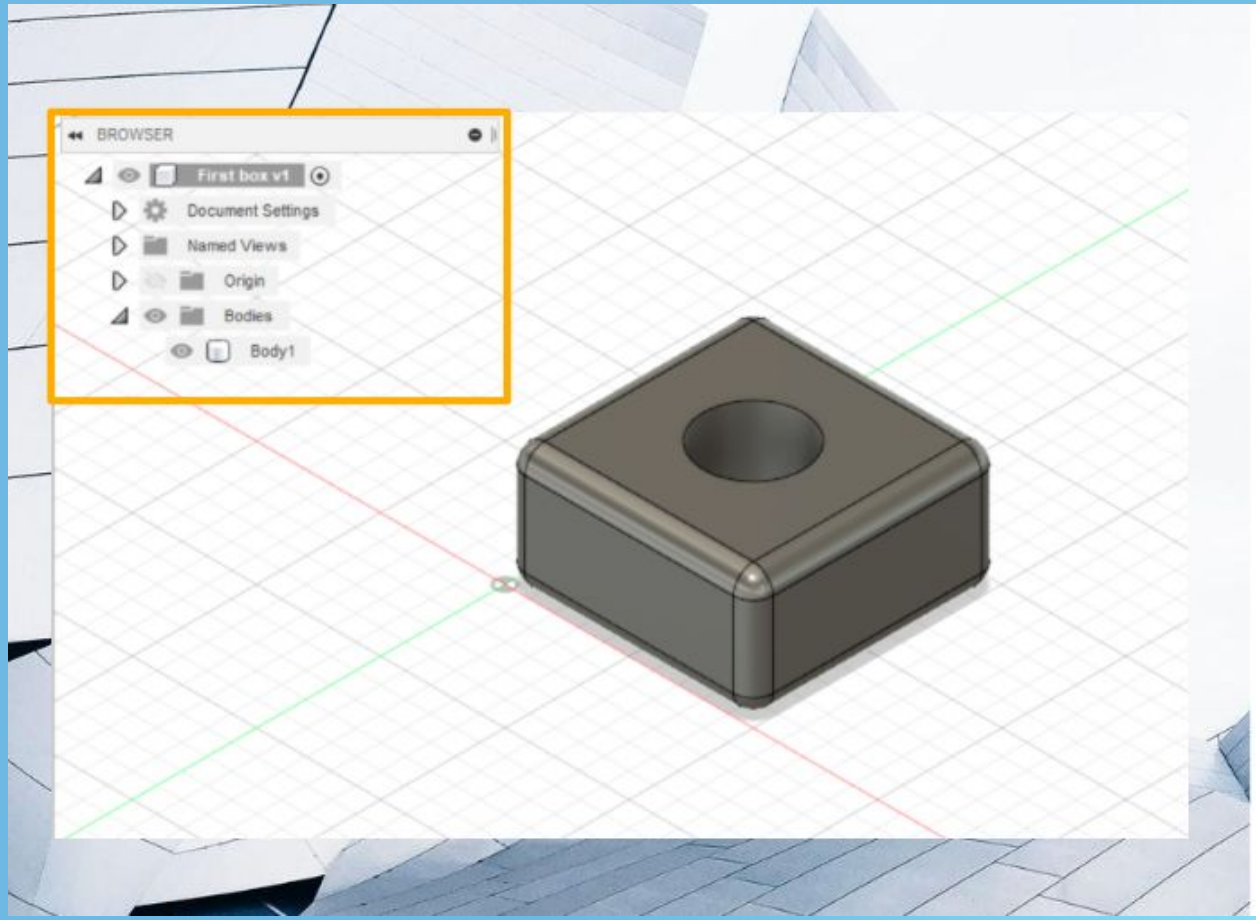
Step 4: Save your design

1. Click the save icon to save the current design
1. Enter **My first box** in the Name field
1. Set the save location to **<your name>'s First Project**
1. Click **Save**



Step 5: Access the Data Panel

1. Click the Left-most icon to display the **Data Panel**
1. The active project is displayed at the top. Thumbnails of all designs in the project are listed
1. All data is stored in **A360 in the cloud**
1. Click the icon again to hide the **Data Panel**

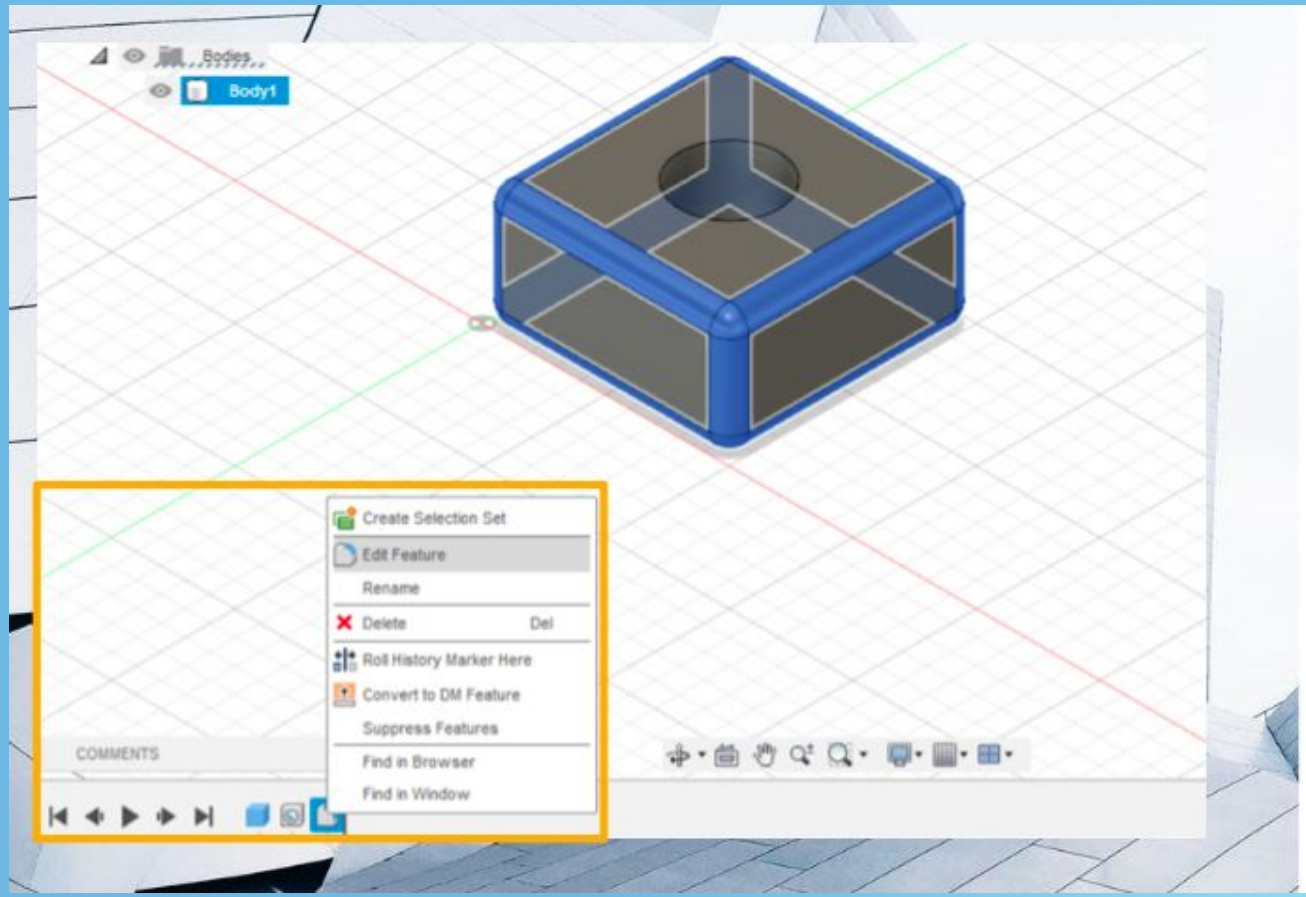


Step 6: Use the Browser

1. Click the **eye** next to Origin to display the XYZ planes
1. Click the eye again to **hide** the planes
1. Click the **arrow** next to Bodies in the browser to show all objects in the current project.

Hidden

Visible



Step 7: Use the Timeline

1. Click the **play button** to replay all operations in the current design

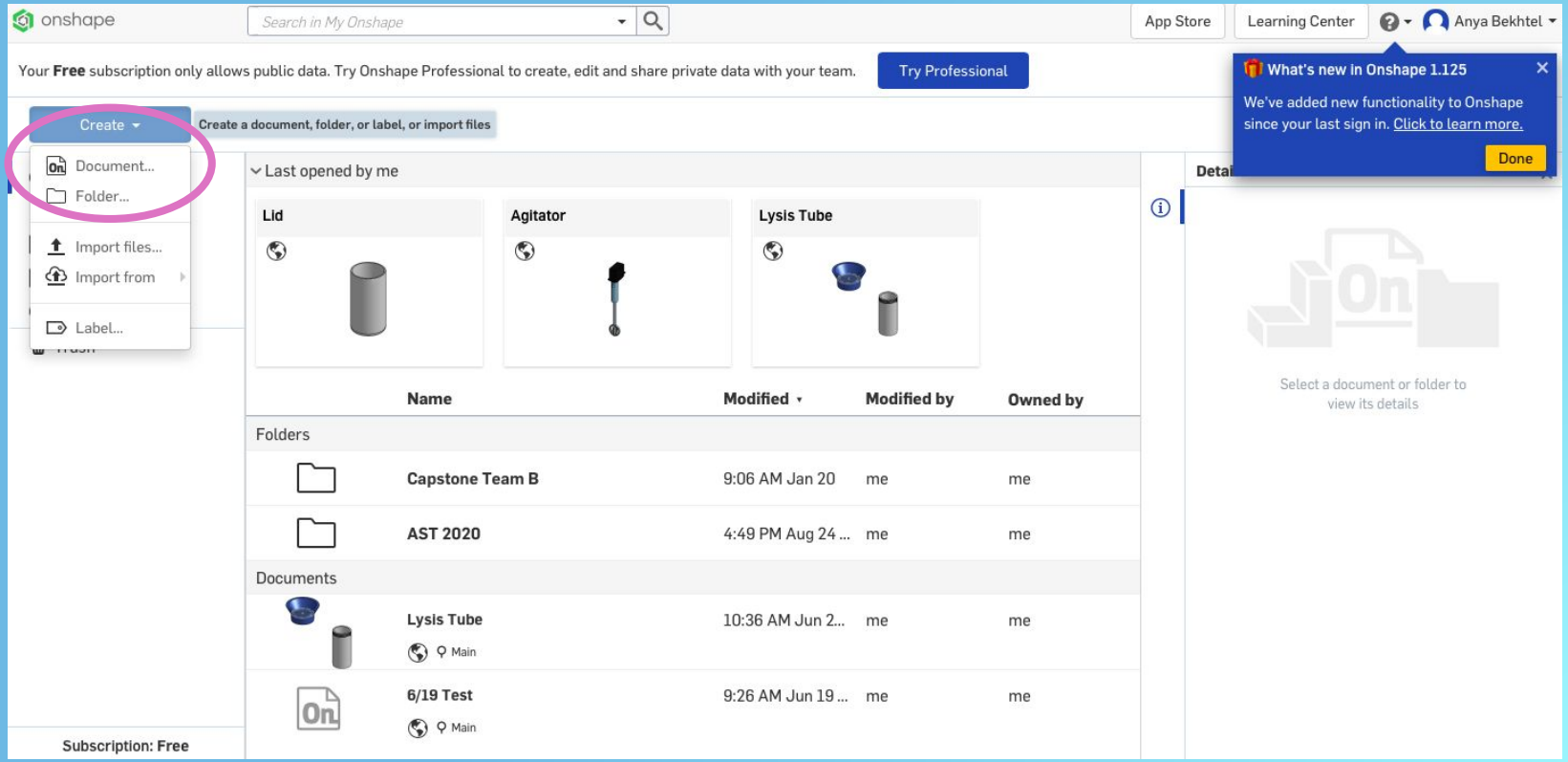
1. **Right-click** the fillet operation on the timeline

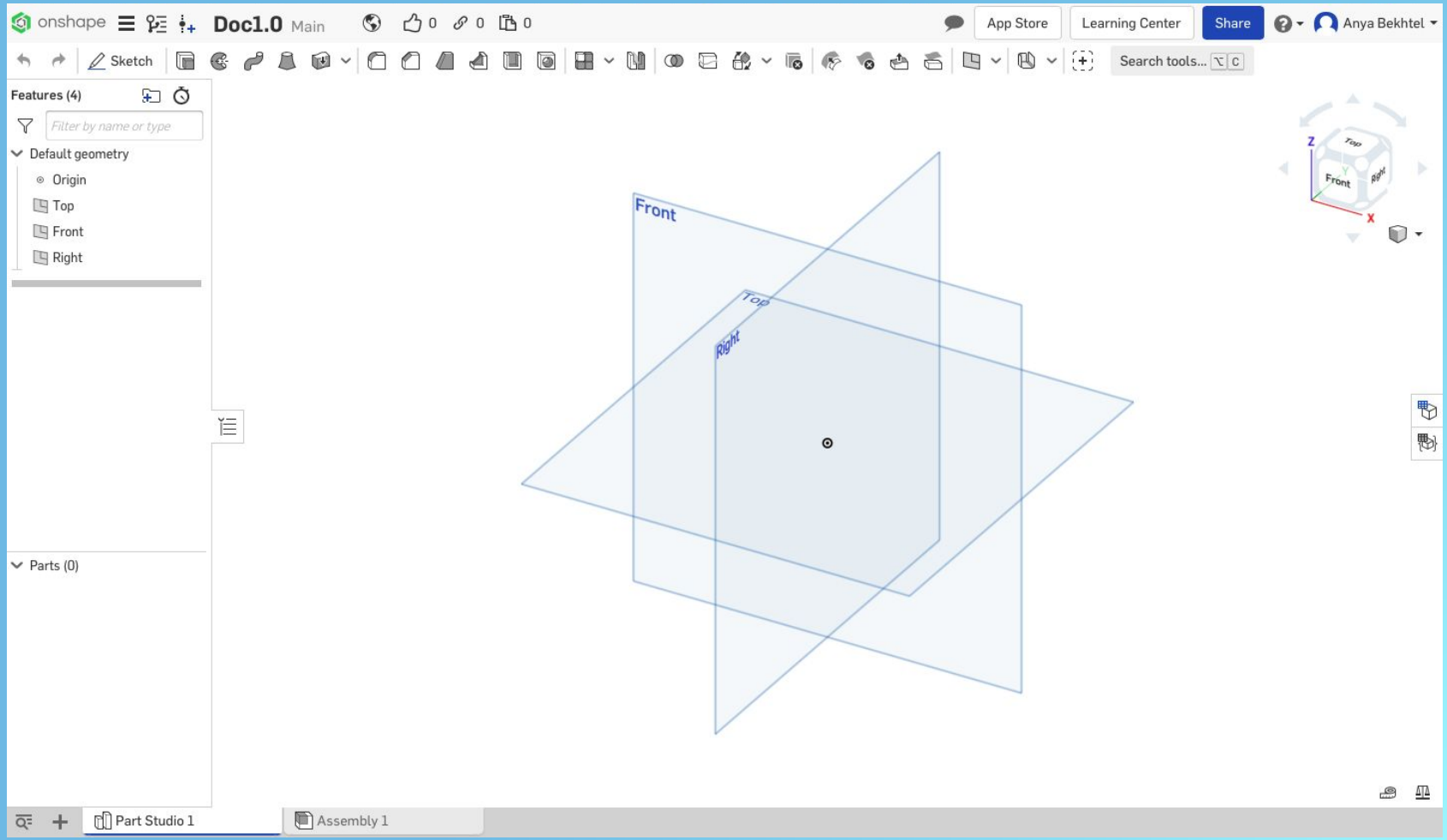
1. Click **edit feature**

1. Change the radius to **5 mm** and click OK

A LOOK AT ON SHAPE

Create a New Document

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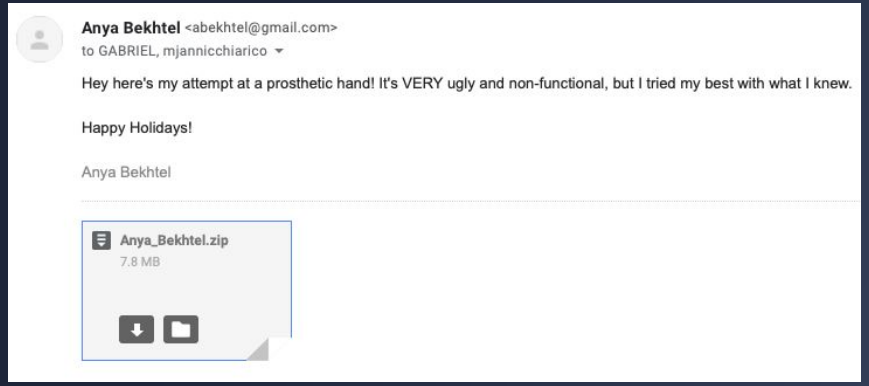
QUESTIONS?

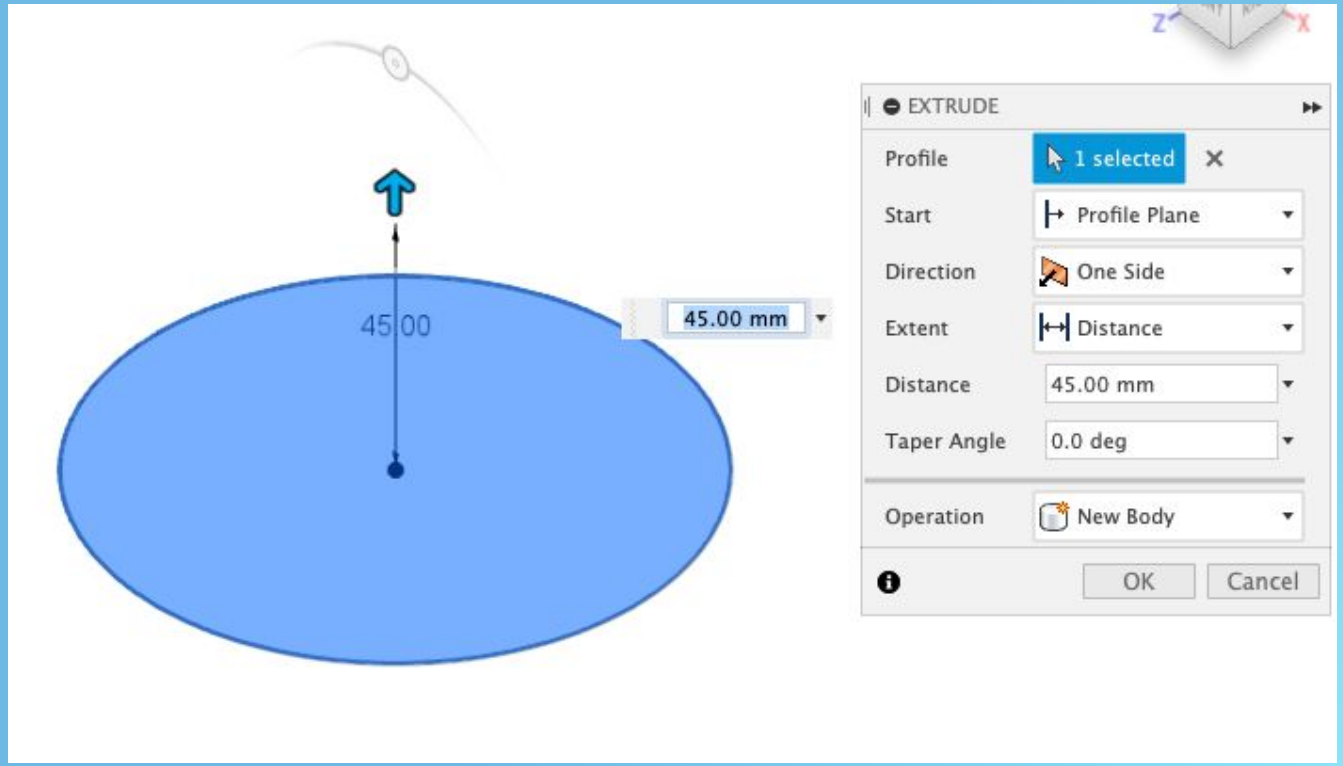

Anya Bekhtel <abekhtel@gmail.com>
to GABRIEL, mjannicchiarico
Hey here's my attempt at a prosthetic hand! It's VERY ugly and non-functional, but I tried my best with what I knew.
Happy Holidays!
Anya Bekhtel
Anya_Bekhtel.zip
7.8 MB

QUESTIONS?

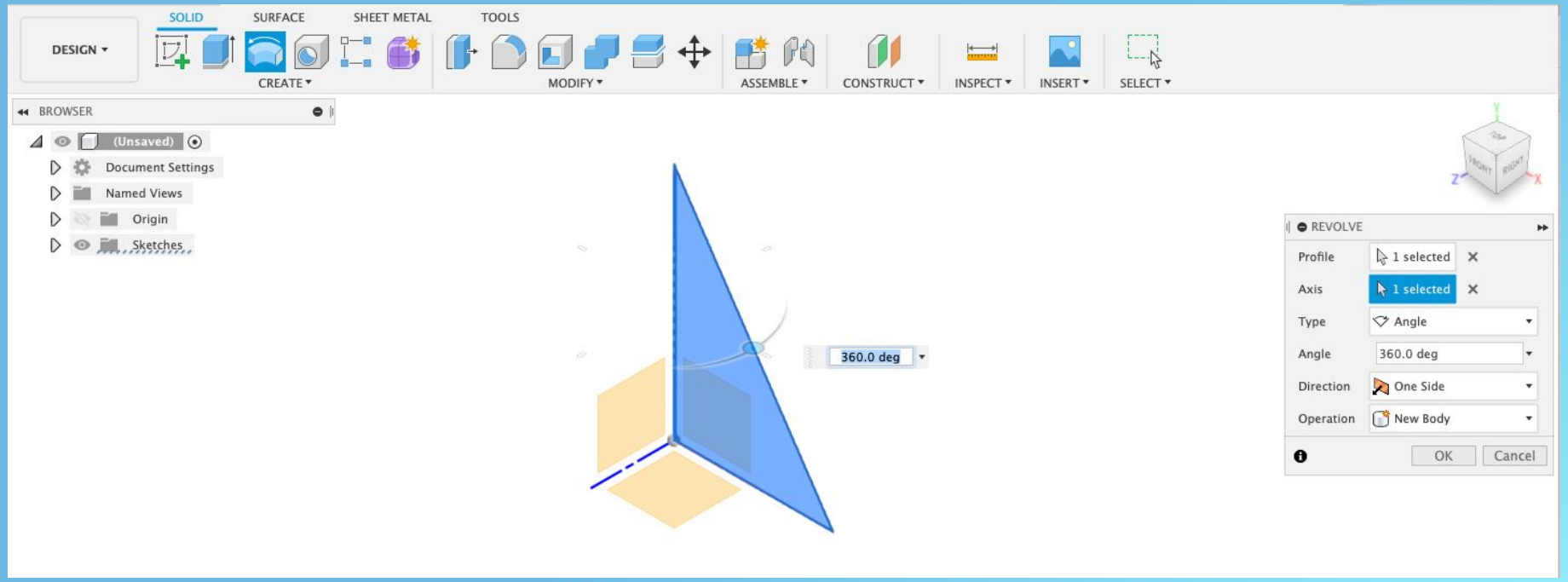
- **Specific things you want in your design?**

- **Commands We Can Also Go Over**
  - Extrude → making a cylinder
  - Revolve → making a cone
  - Thread → making threading for screws
  - Appearances → making things look like real objects

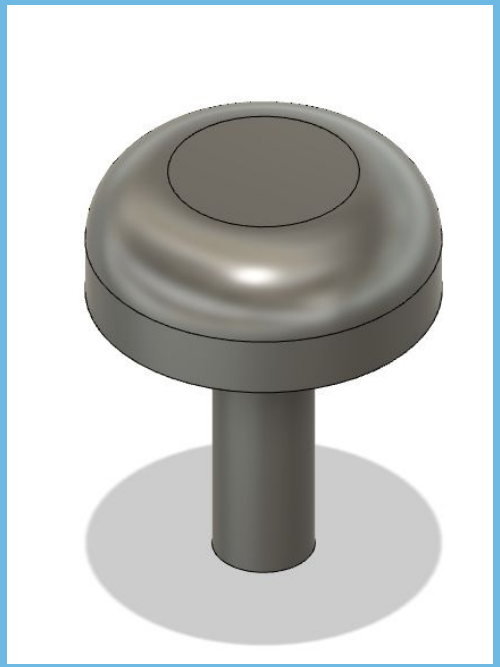
AUTODESK SUPPLEMENTARY

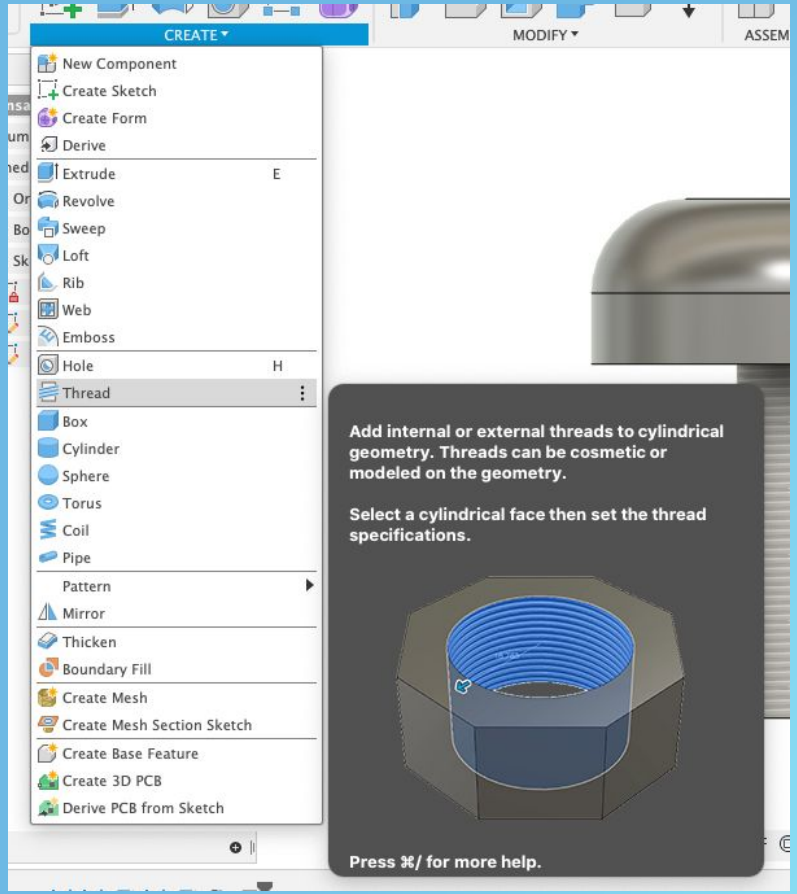


Sketch on top plane → center point circle → smart dimension to size you want → exit sketch → right click to press pull into cylinder

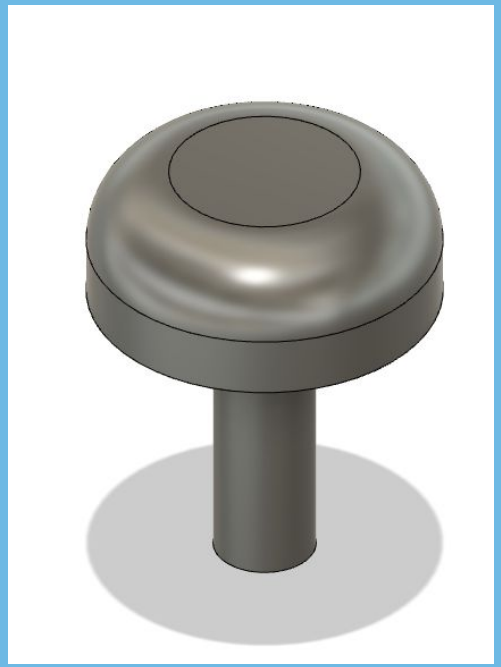


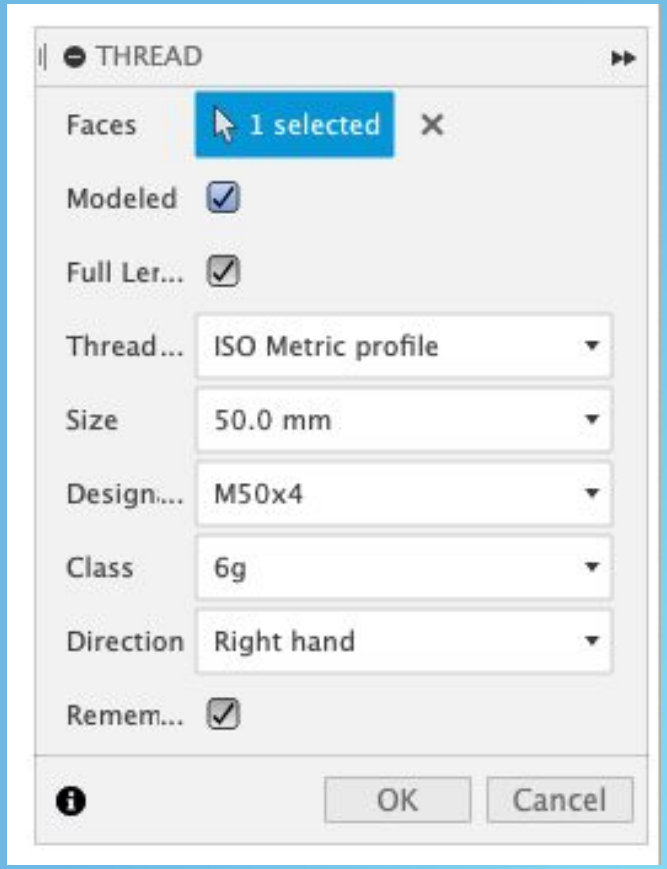
Sketch on front plane → two point rectangle → smart dimension to size you want → diagonal line on rectangle → trim two additional rectangle lines → exit sketch → revolve triangle about center axis to make cone



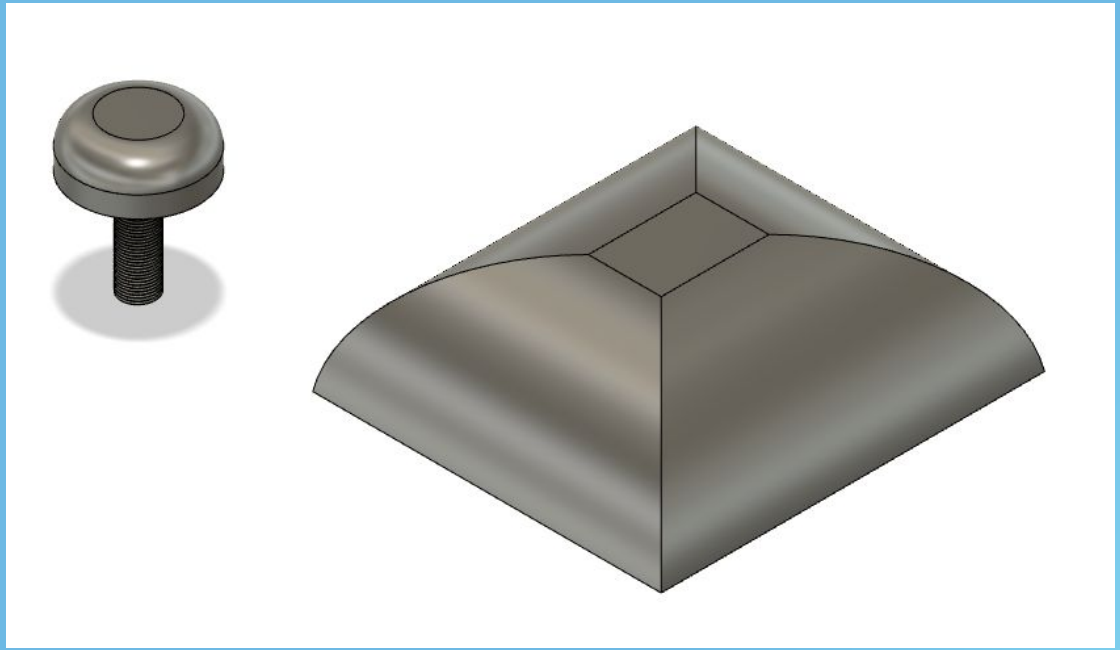


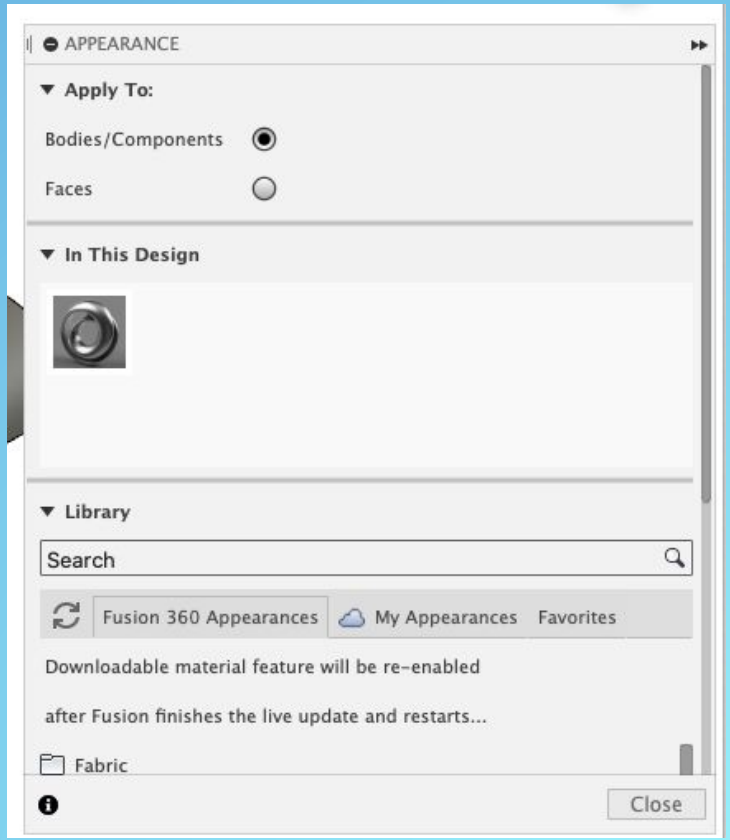
For modeling purposes: can use the “tread” tool





When printing: make sure “modeled” box is checked





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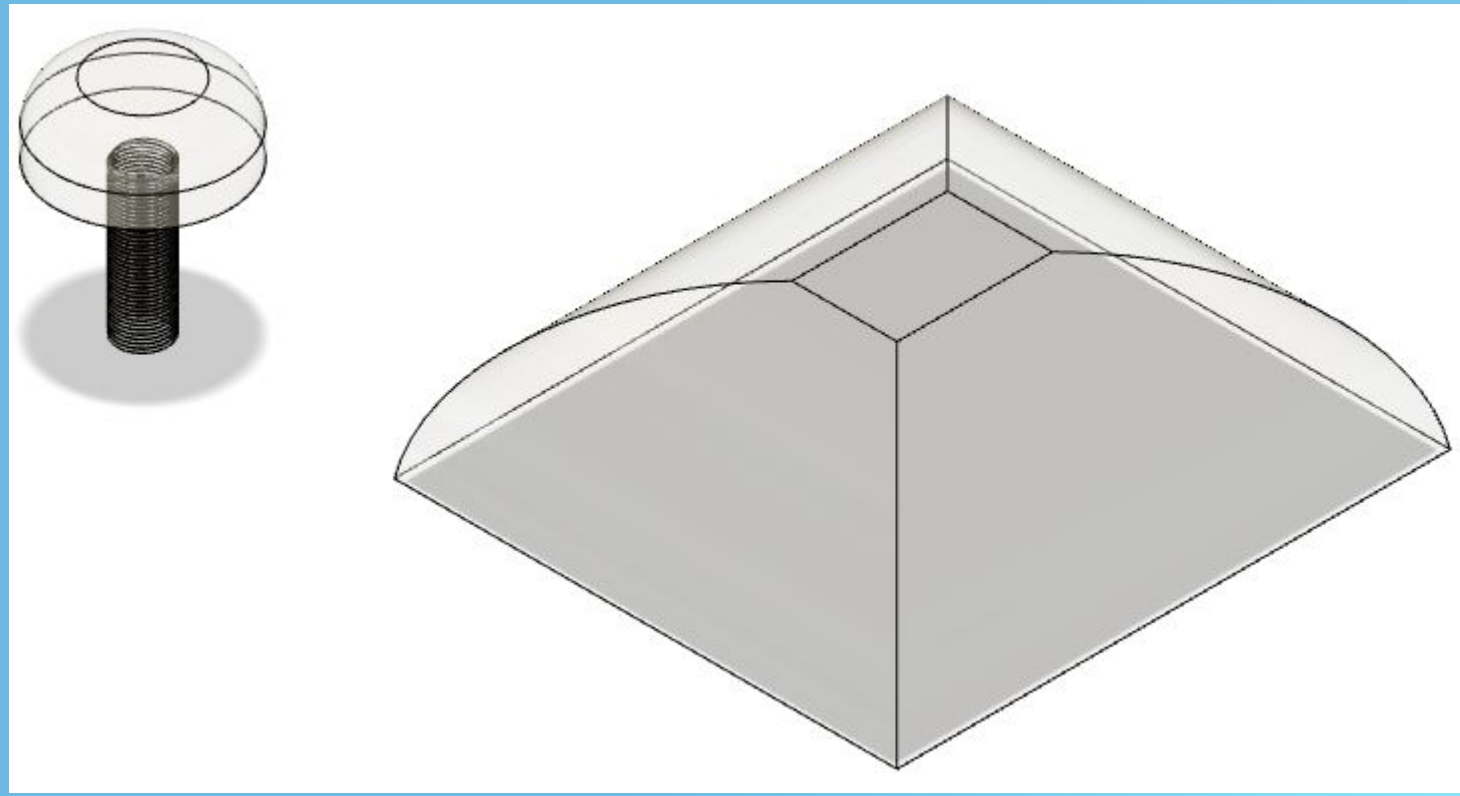
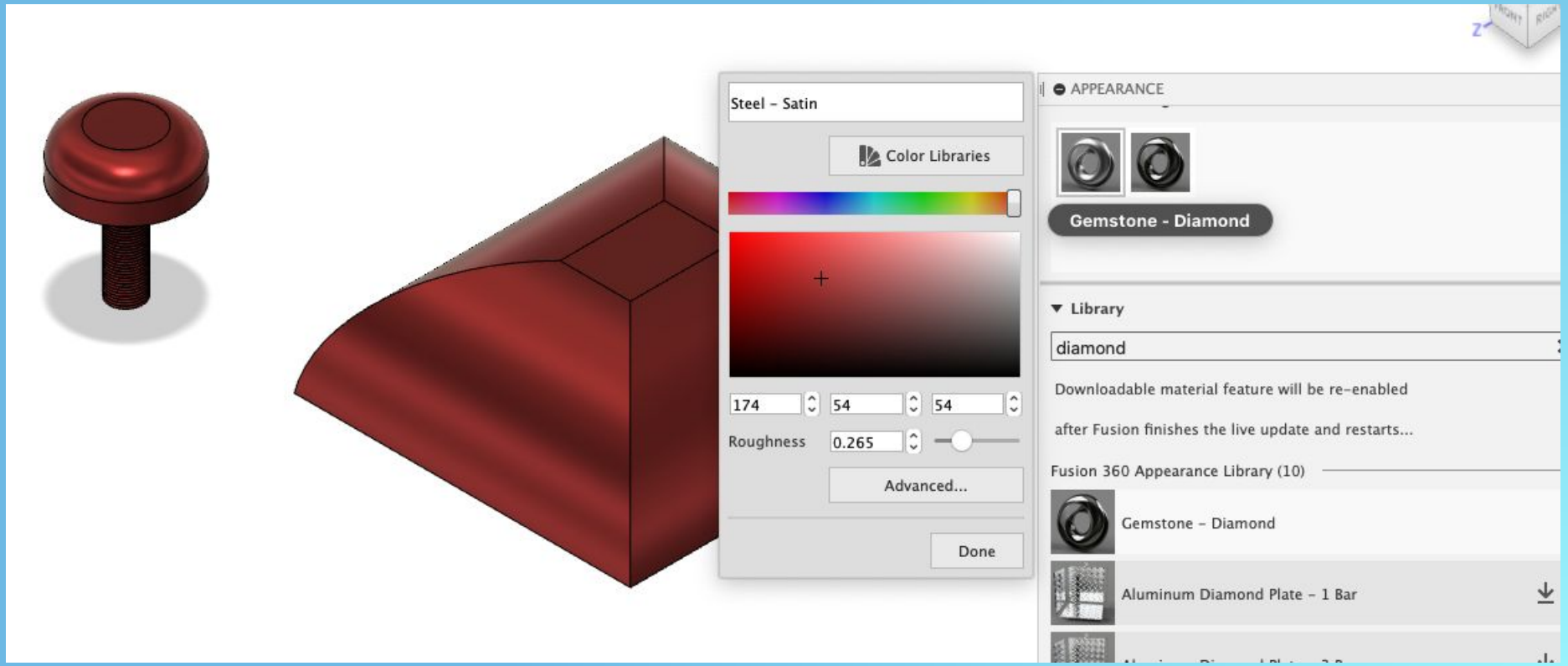


Can change your part material



Can also change your part color!