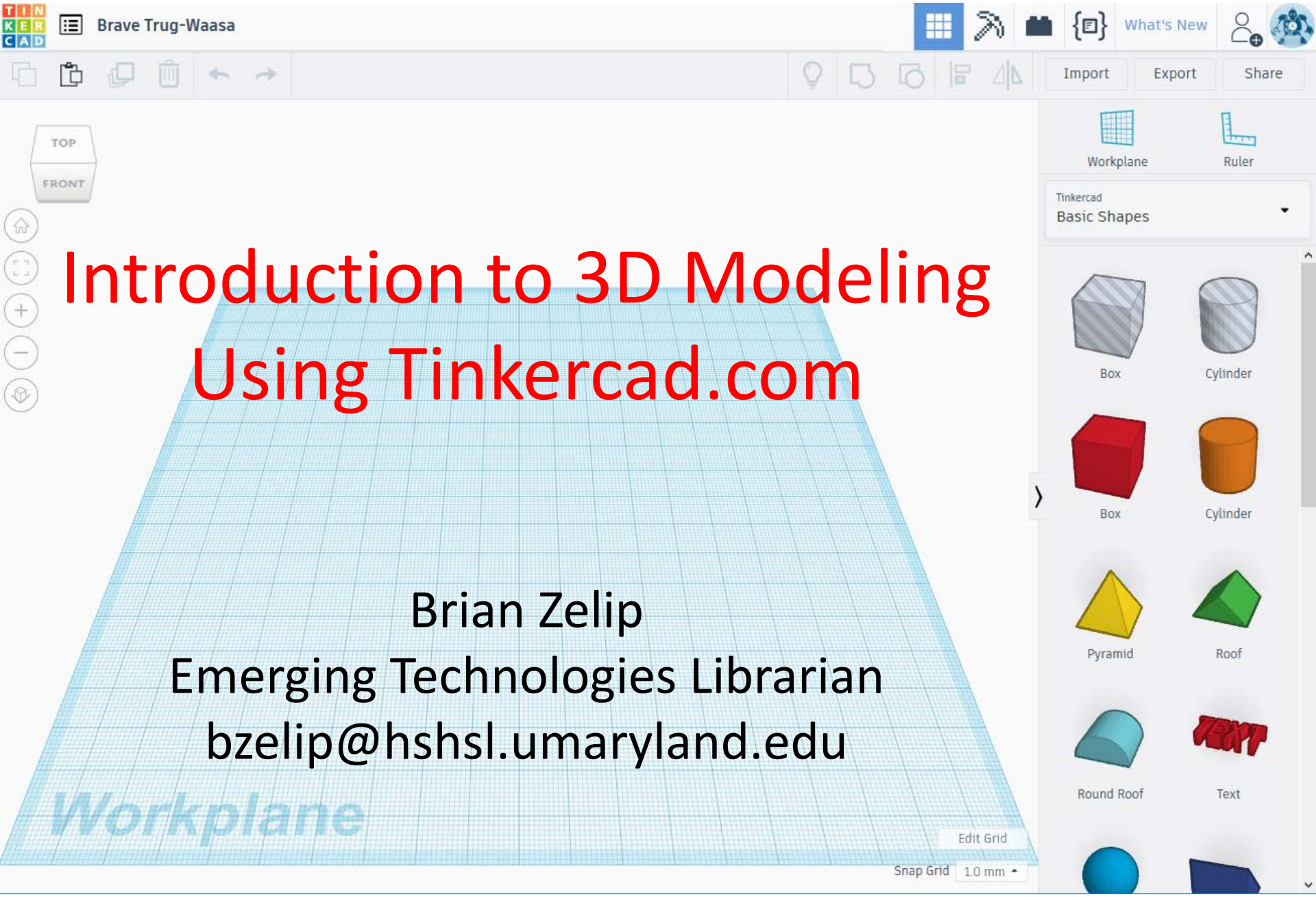
Brave Trug-Waasa
What's New
Import
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TOP
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Tinkercad
Basic Shapes
Box
Cylinder
Box
Cylinder
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Roof
Round Roof
Text
Edit Grid
Snap Grid
1.0 mm
Introduction to 3D Modeling
Using Tinkercad.com
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Emerging Technologies Librarian
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Workplane

In this workshop we will…

- Browse existing 3D models online
- Create a 3D model using Tinkercad.com

Websites that provide 3D models in the .STL file format:

- NIH 3D Print Exchange
- Thingiverse
- Instructables
- 3D Warehouse
- GrabCAD
- Ponoko
- Nervous System
- Yeggi

Now let’s build our own 3D model!

A digital caliper is a tool used to measure physical objects.

Go to Tinkercad.com

Tinkercad is a free, online 3D design app

1. Go to tinkercad.com
2. Sign up for a free account

Tinkercad Basics – Mouse Control

- **Left button**: selects tools and a single object on the grid by clicking; selects multiple objects on the grid by clicking and dragging a rectangle around the objects you wish to select.
- **Center wheel hold**: pans around objects by holding the mouse wheel and dragging the mouse side to side.
- **Center wheel spin:** zooms the workspace view in and out.
- **Right button**: orbits around in space by holding the button and dragging.

Tinkercad Basics – Keyboard

Moving object(s)	
↑ / → / ← / ↓	**Move** object(s) along X/Y
ctrl + ↑ / ↓	**Move** object(s) along Z
Shift + ↑ / → / ← / ↓	**×10 Nudge** along X/Y
ctrl + Shift + ↑ / ↓	**×10 Nudge** along Z

Keyboard + mouse shortcuts (press and hold kbd btn, then move mouse)	
Alt + left mouse button	**Duplicate** object(s)
Shift + left mouse button	**Select** multiple object(s)
Shift + hold while rotating	**45° rotation**
Alt + hold *side handle*	**Scale (1D)**
Alt + hold *corner handle*	**Scale (2D)**
Shift + hold *corner handle*	**Scale (3D)**
Shift + Alt + hold *corner handle*	**Scale (3D)**
Shift + Alt + hold *top handle*	**Scale (3D)**
Shift + right mouse button	**Pan view**

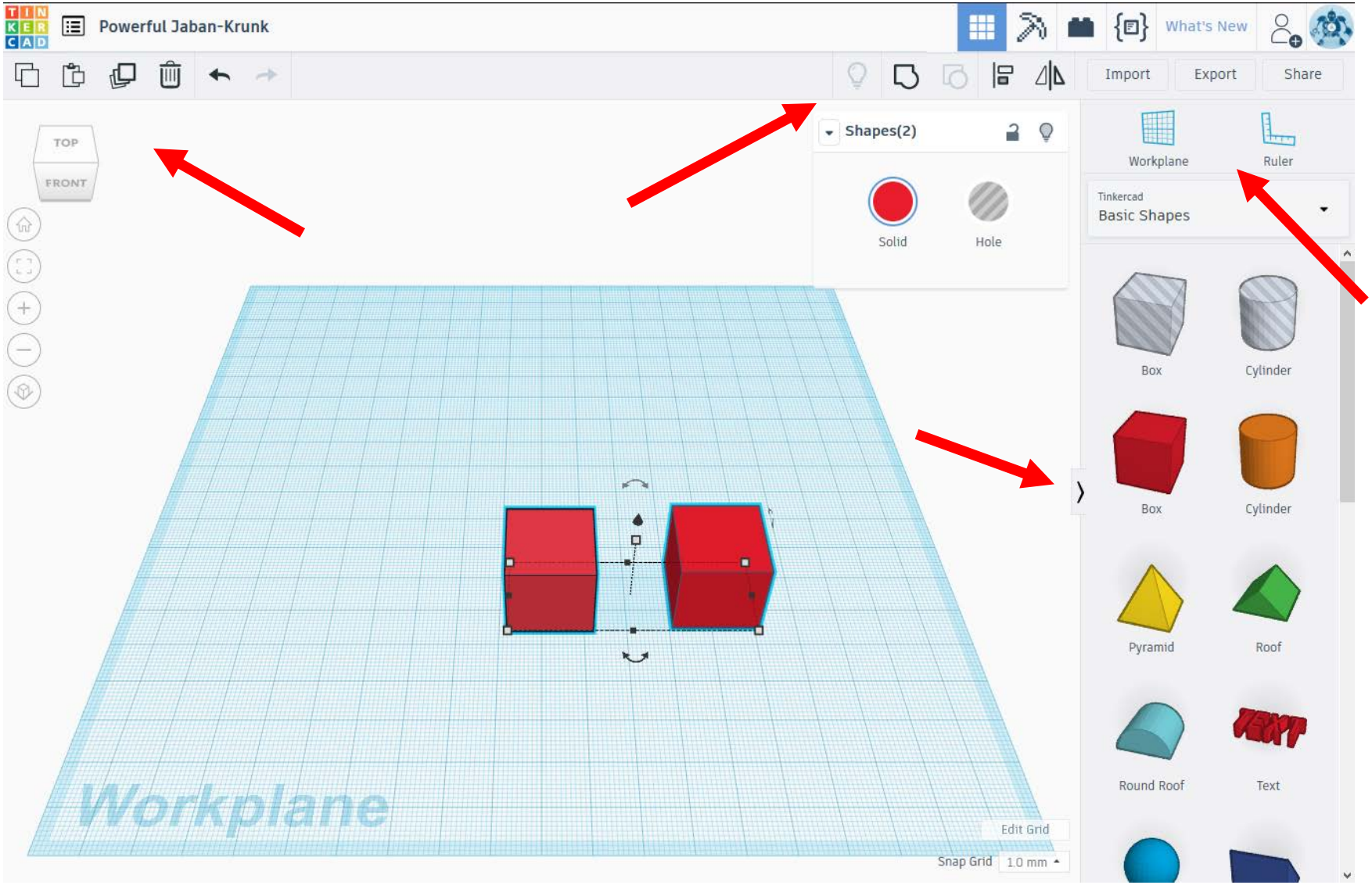
General shortcuts	
ctrl + C	**Copy** object(s)
ctrl + V	**Paste** object(s)
ctrl + Z	**Undo** action(s)
ctrl + Shift + Z	**Re-do** action(s)
ctrl + G	**Group** object(s)
ctrl + shift + G	**Un-group** object(s)
ctrl + D	**Duplicate** in-place
ctrl + L	**Lock** object(s)
ctrl + A	**Select** all object(s)
Del	**Delete** object(s)
W	**Workplane** toggle
R	**Ruler** toggle
F	**Fit view** to selected object(s)
D	**Drops** object(s) to work plane

Legend

ctrl = Cmd / Alt = Option

via https://www.tinkercad.com/learn/

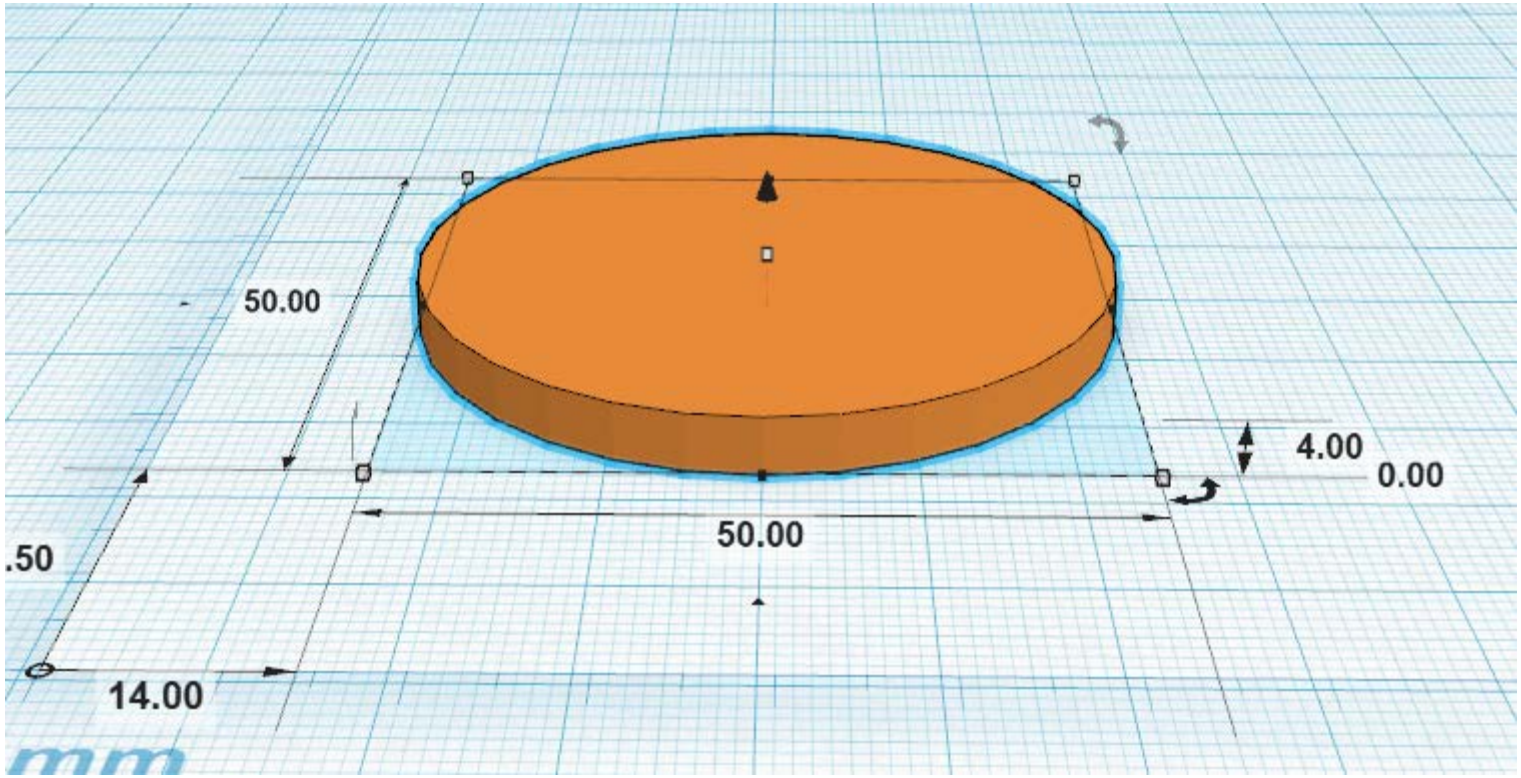
Tinkercad Basics – Tools



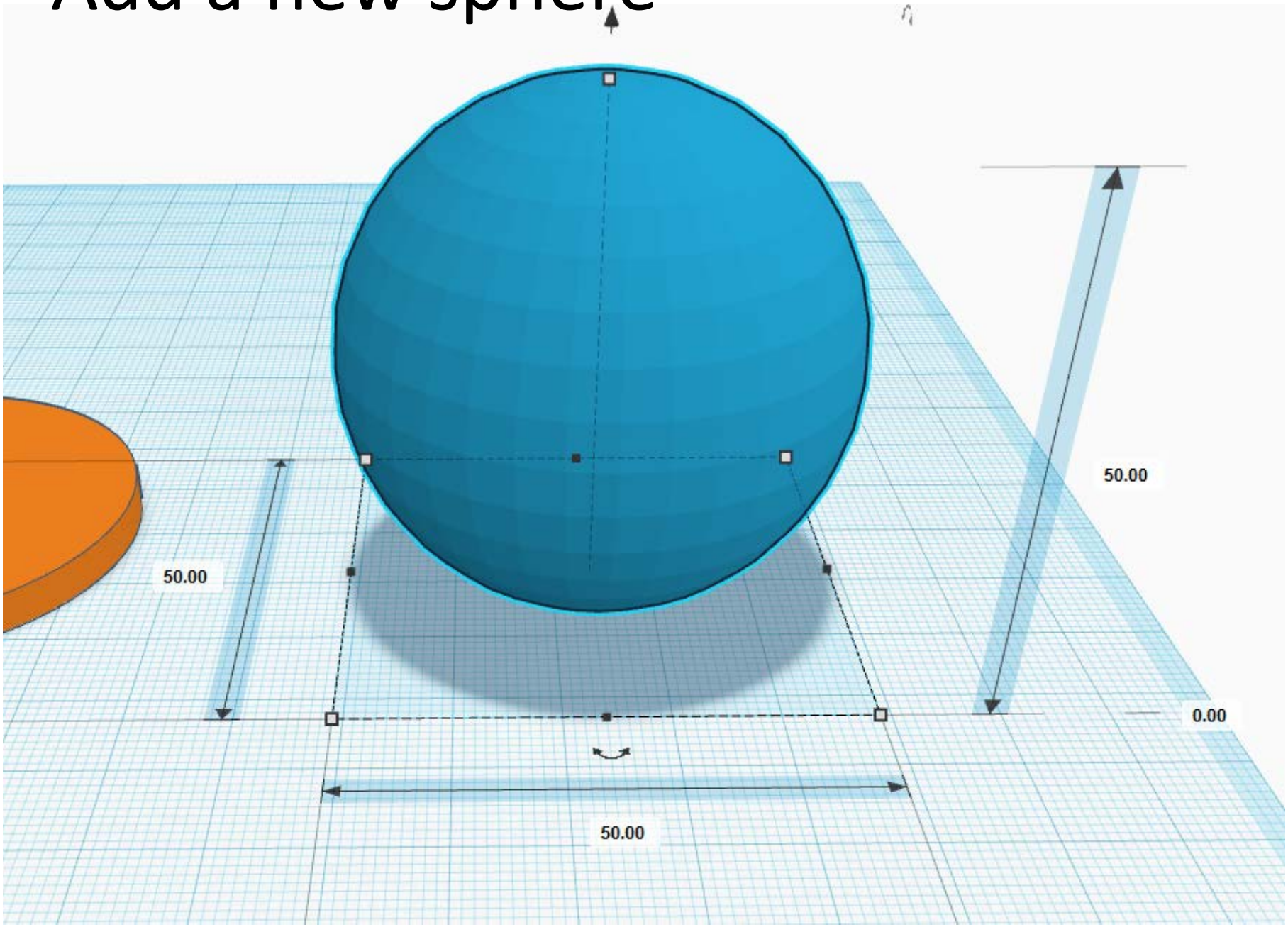
About the Following Slides

Each of the following slides show the end result of the instructions contained on that slide.

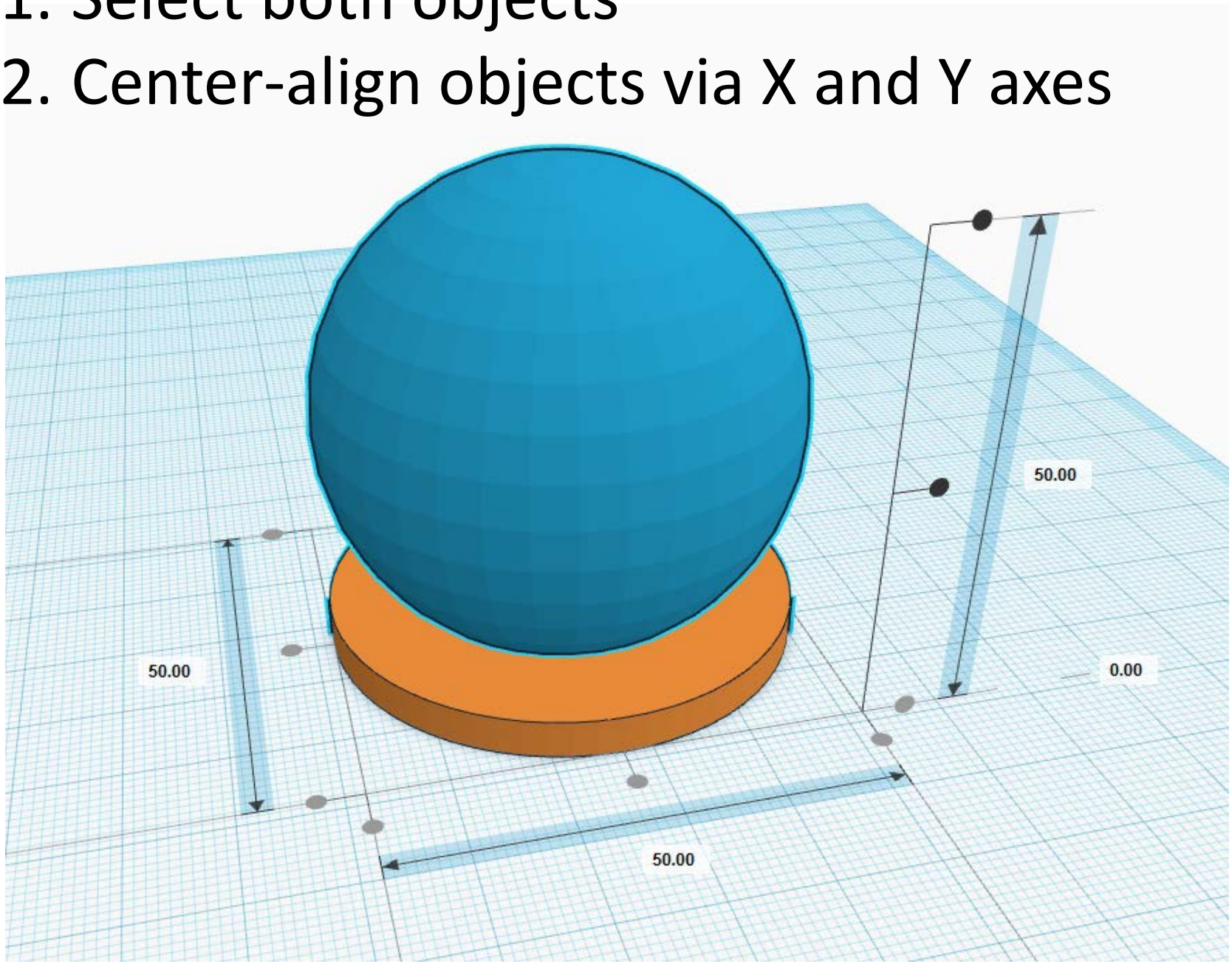
Start with a new cylinder



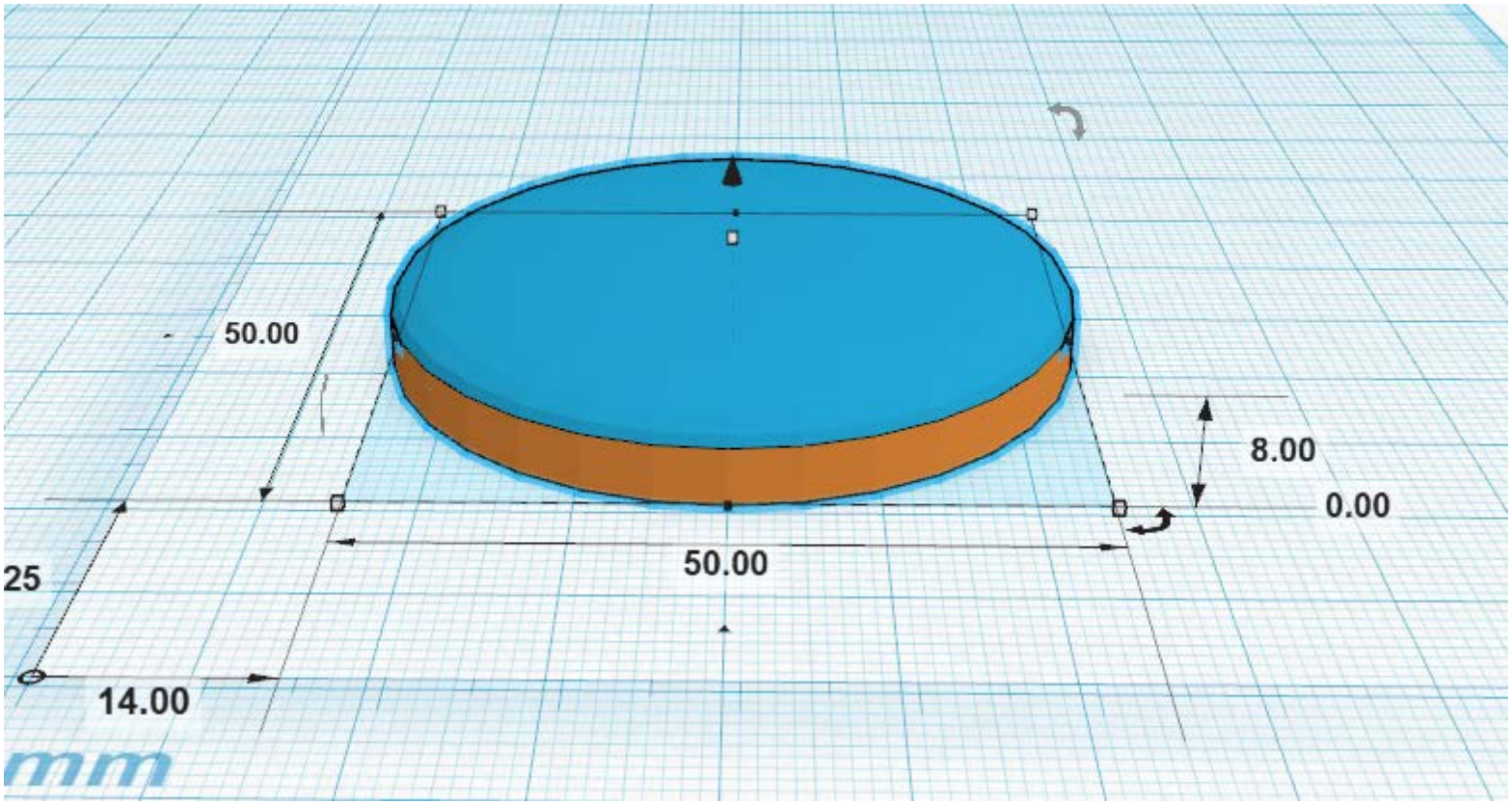
Add a new sphere



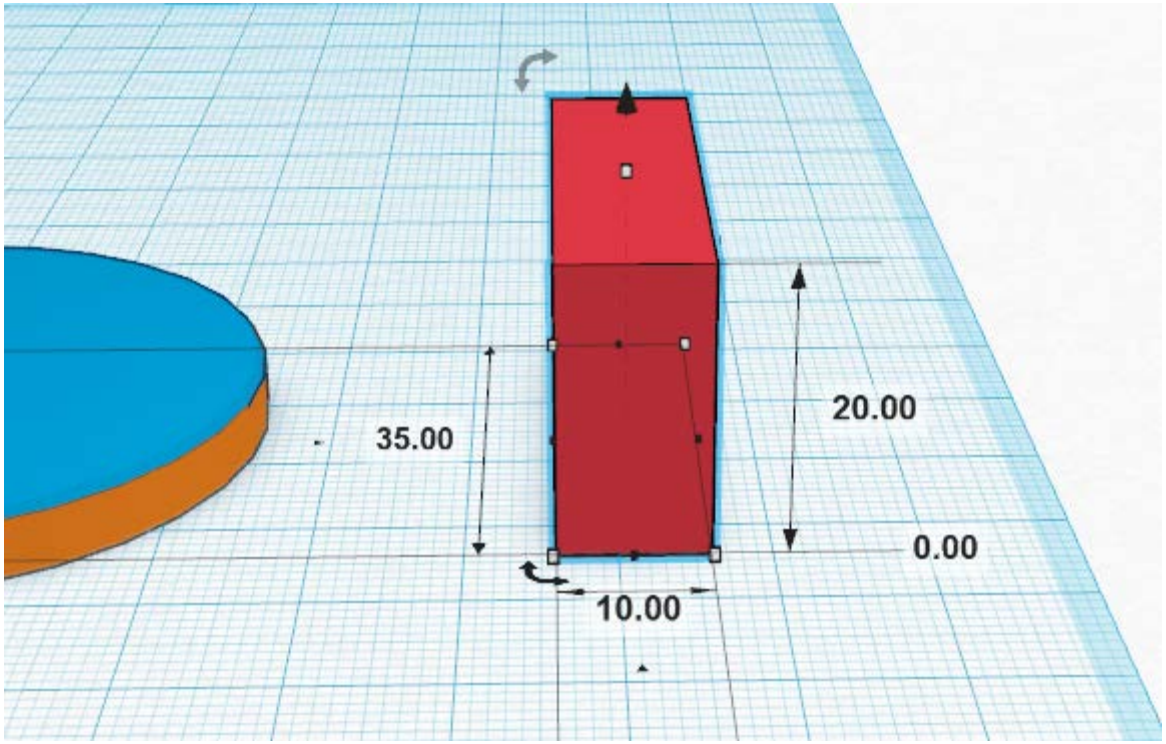
1. Select both objects
2. Center-align objects via X and Y axes



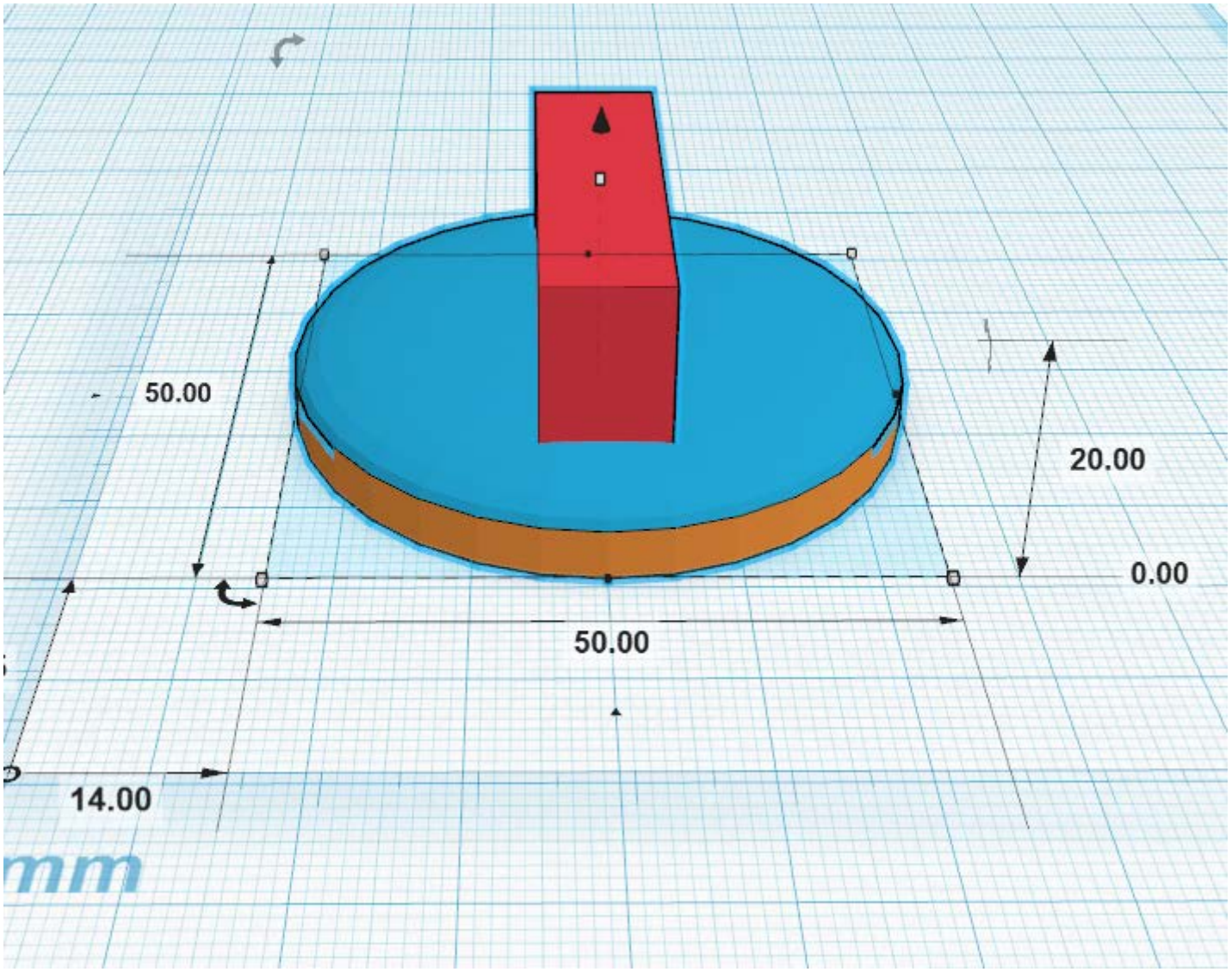
1. Adjust sphere height
2. Select both objects
3. Group both objects



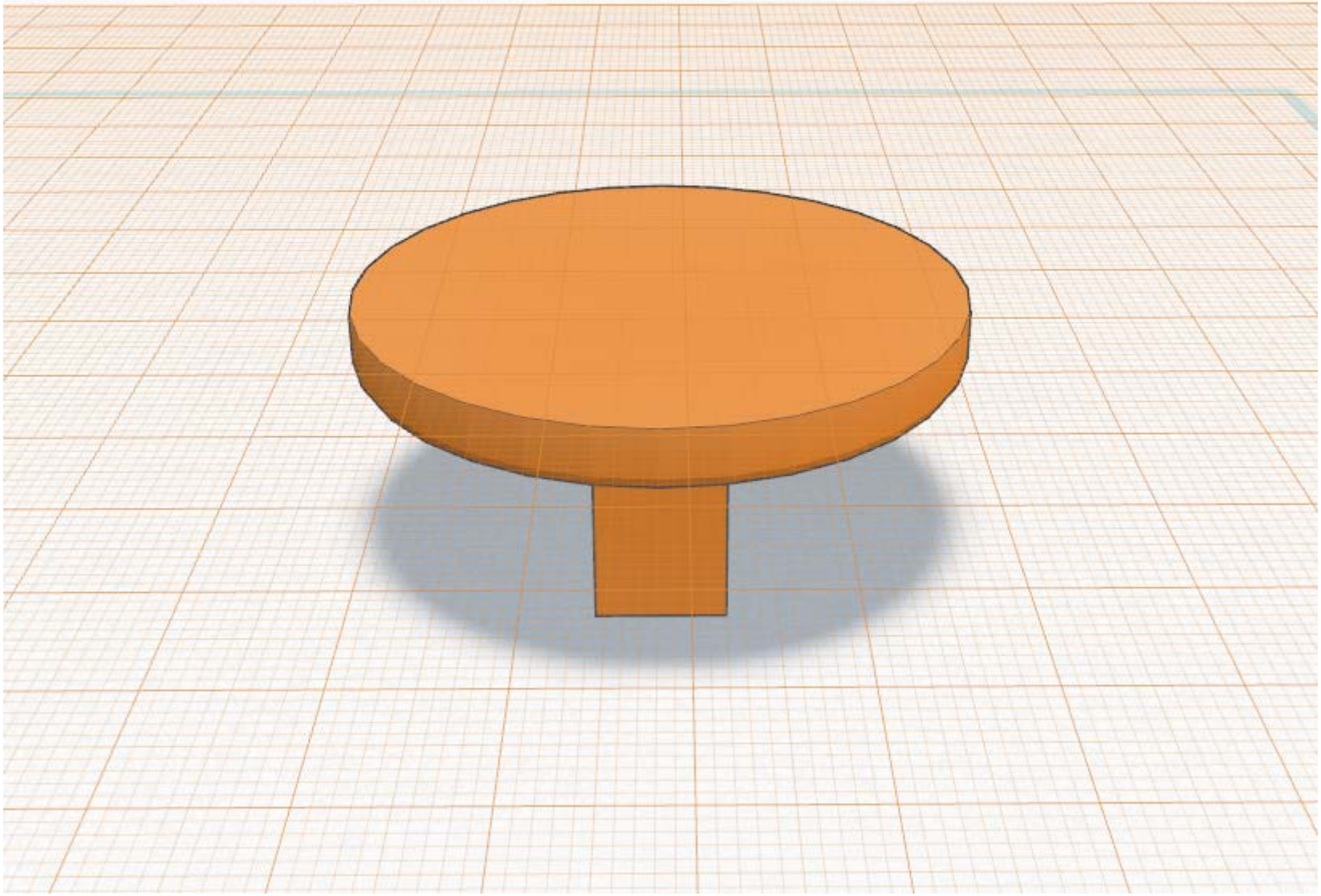
Add a new box



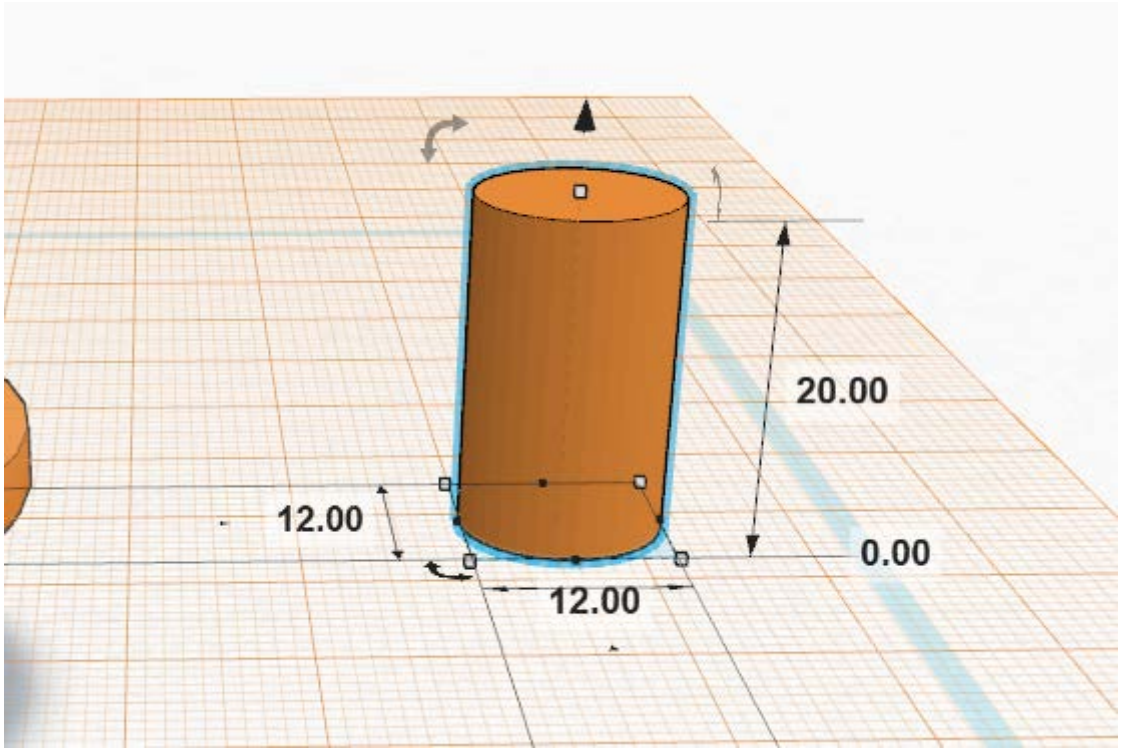
Align box to base



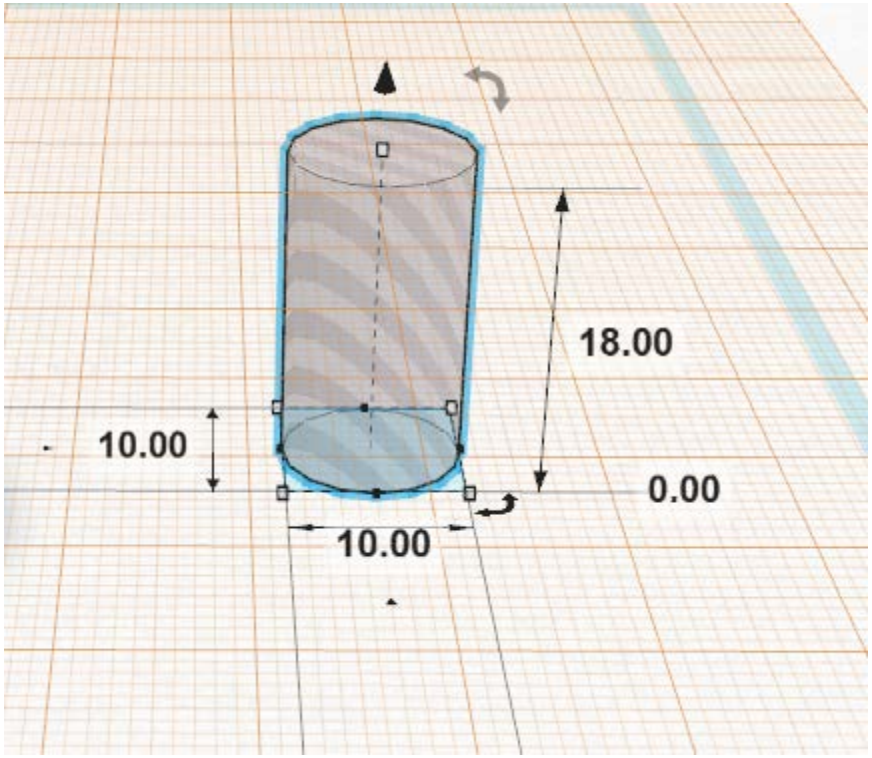
1. Rotate object 180°
2. add new workplane to top surface



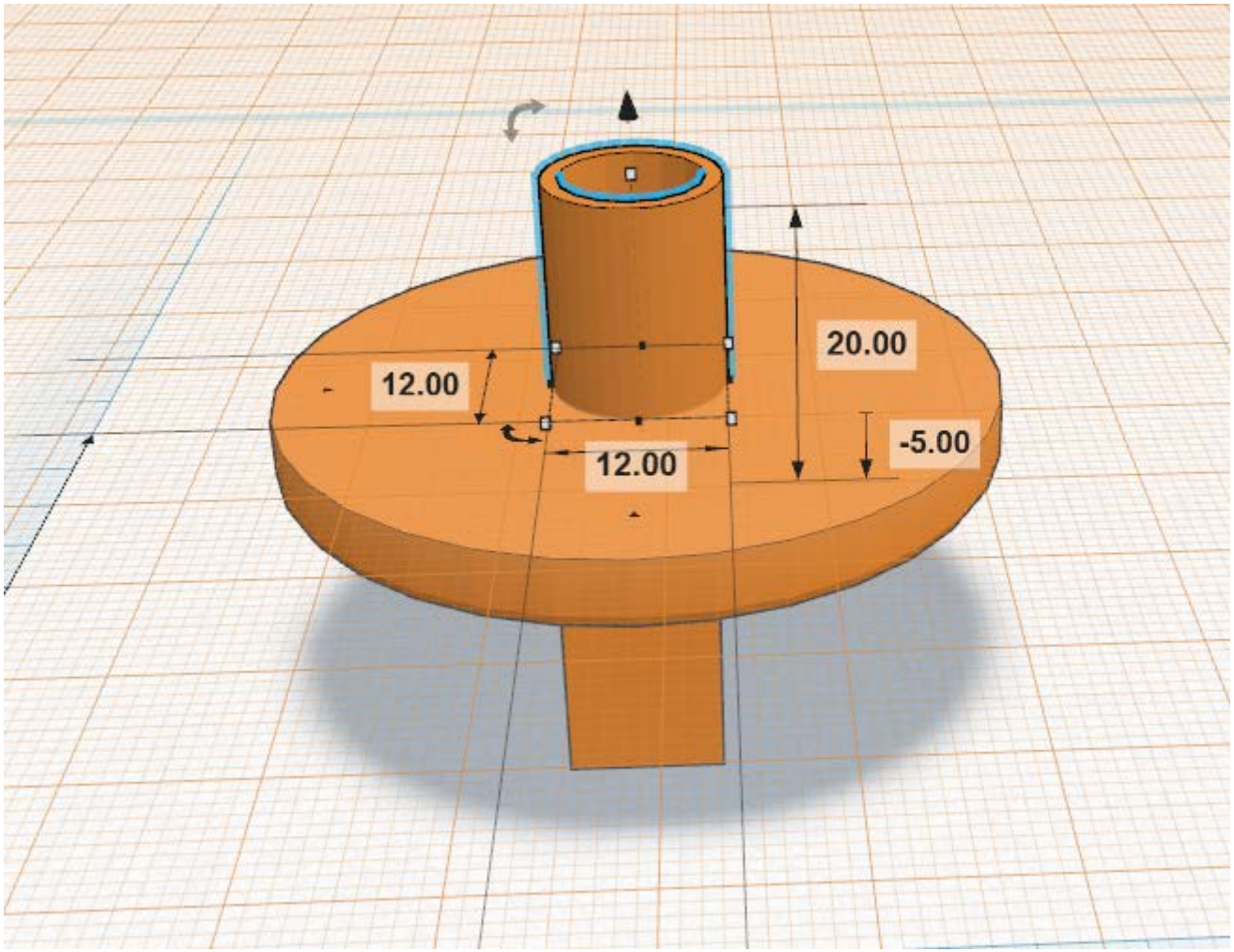
Add a new cylinder



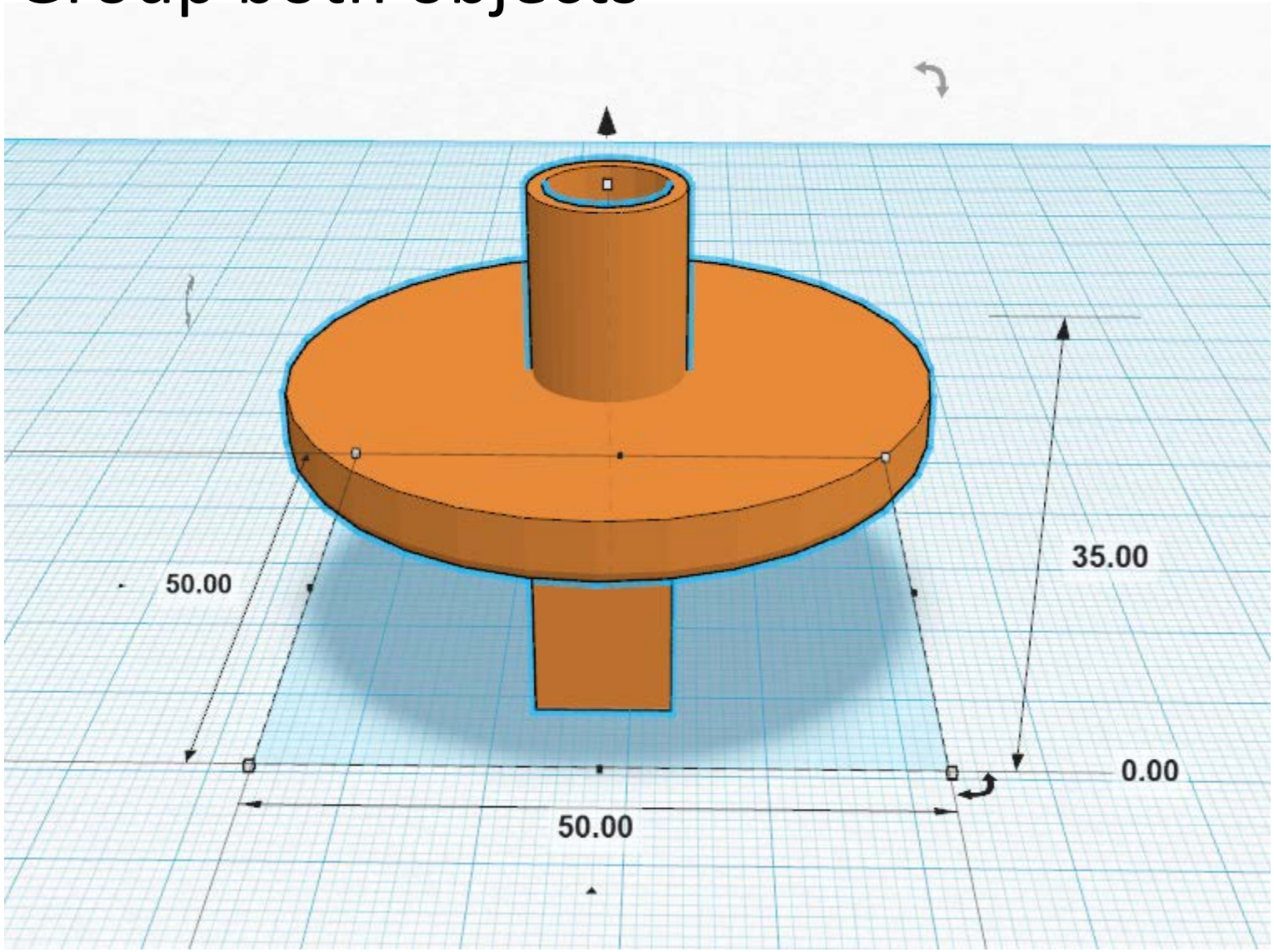
1. Add a new cylinder
2. Make it a hole object



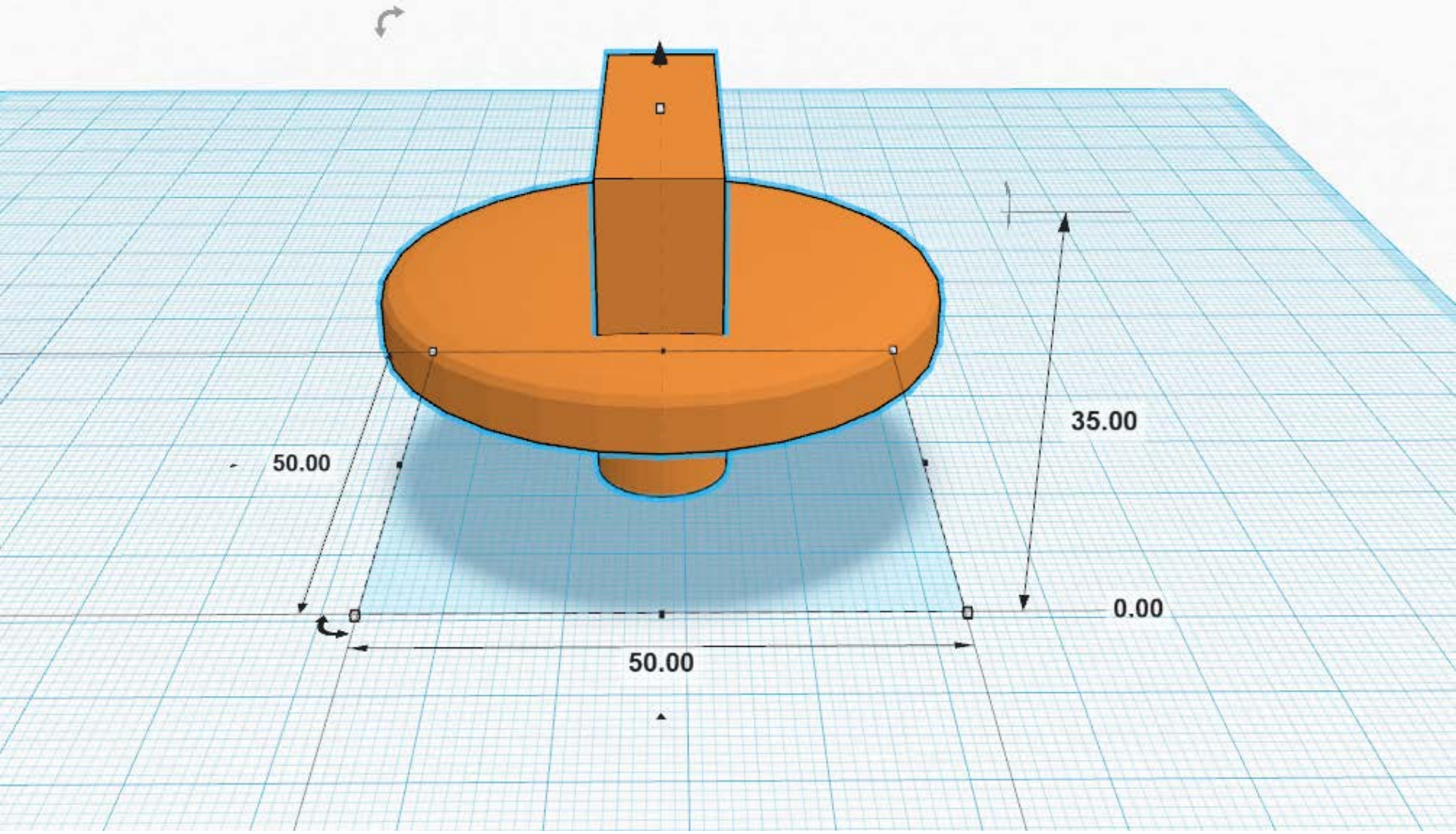
1. Center-align both cylinders by X and Y axes
2. Top-align both cylinders by Z axis
3. Group both cylinders to make the hole



1. Center-align both objects by X and Y axes
2. Group both objects



Rotate, then export!



For more info, see

guides.hshsl.umaryland.edu/tinkercad