

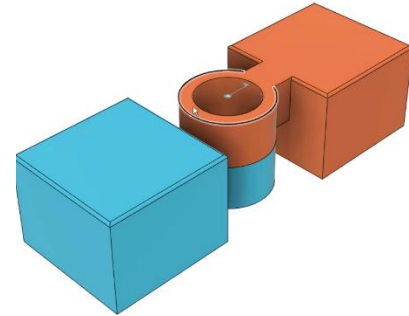
Practice exercise: Assembly modeling

Exercise duration: ~15 minutes

Use Assembly tools to define relationships between components.

Learning objectives:

- Apply As-Built Joints.
- Apply Joints.



The completed exercise

1. Open the supplied dataset **general_joints.f3d**.

NOTE: The Browser contains component groups for each type of joint.

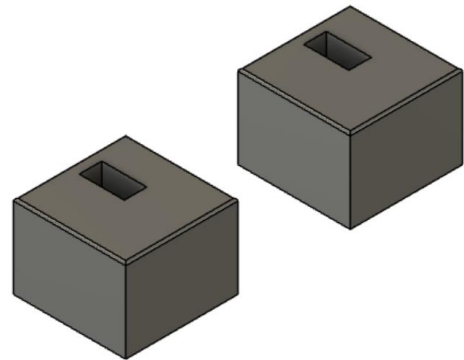


Figure 1. Uploaded design.

2. For the Rigid component group, select Assemble > As-built Joint and set a rigid joint type between the two blocks.

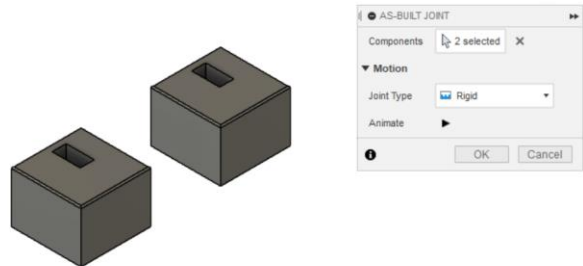


Figure 2. Apply As-built Rigid joint

3. Alternatively, to anchor the Rigid component group to the origin, create a Rigid Group between the two blocks and the origin of the Rigid component group.

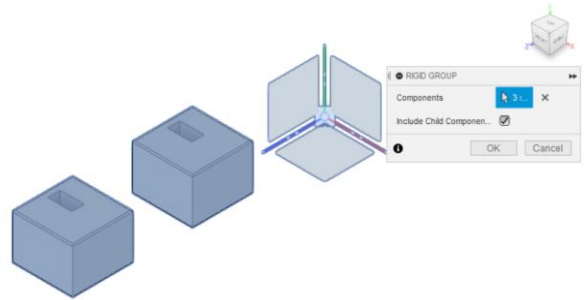


Figure 3. Create a Rigid Group

4. Hide the Rigid component group and show the Revolute component group in the Browser.

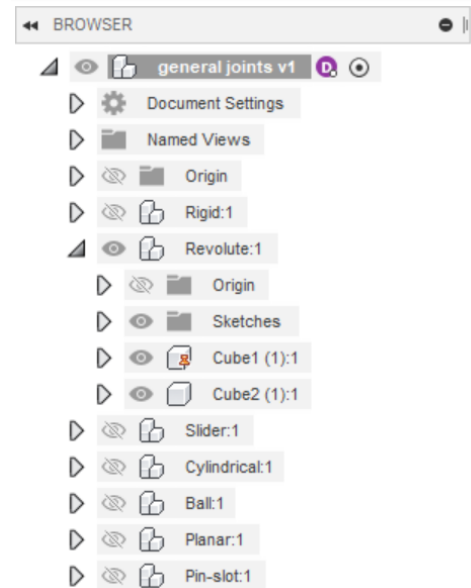


Figure 4. Show/Hide components in the Browser

5. Select Assemble > As-built Joint. Select the two components shown and set the Type to Revolute. Set the Snap point to be the center of the boss for the two blocks as shown in Figure 5.

NOTE: Component Color Cycling has been activated to help differentiate components. This can be done in the Inspect dropdown menu.

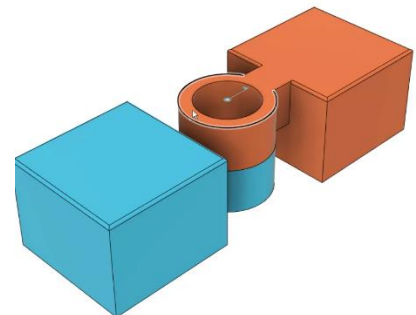


Figure 5. Apply As-built Revolute joint

6. Hide the Revolute component group and show the Slider component group in the Browser. Apply an As-built Slider joint between the blocks using one of the edges of the slot as the Snap reference.

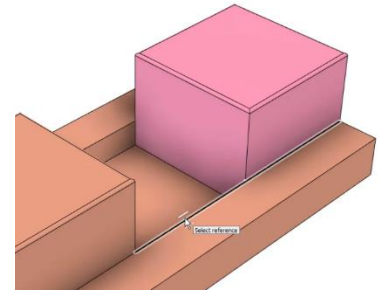


Figure 6. Apply As-built Slider joint

7. Show the Cylindrical component and define a Cylindrical Joint using the Assemble > Joint tool. Select the Snap reference at the lower point on the inside bore as depicted in Figure 7.

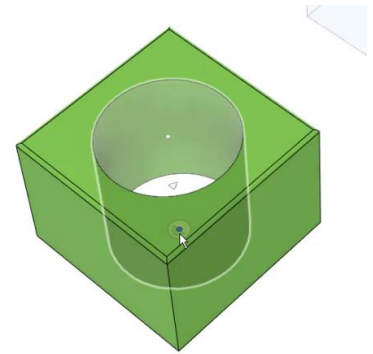


Figure 7. Define Snap reference

8. Select the lower point on the boss for the second component reference. In the Motion tab of the Joint dialog, select Cylindrical. Verify that the animation of the joint motion is correct.

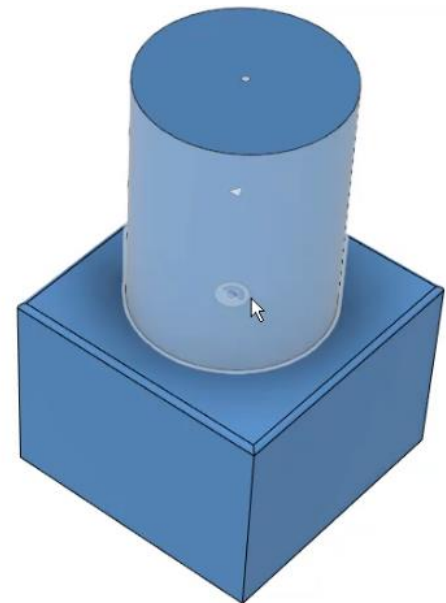


Figure 8. Complete Cylindrical joint configuration

- 9.** Hide the Cylindrical component and show the Ball component. Apply a Ball joint between the ball component and the block by selecting the spherical faces on each component as the Snap reference. In the Motion tab of the Joint dialog, select Ball and verify that the animation of the motion is correct.

NOTE: With the ball type joint, selecting these faces will place the Snap reference at the center point of each.

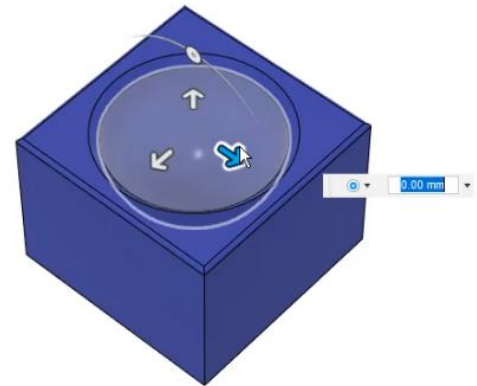


Figure 9. Apply Ball joint

- 10.** Hide the Ball component and show the Planar component in the Browser. Set up a Planar joint between the bottom of the block and the top of the plate. Component position is not critical as the block will be free to move on the plate.

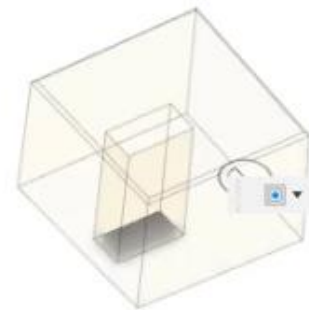


Figure 10. Apply Planar joint

- 11.** Animate and test the motion of the Planar joint.

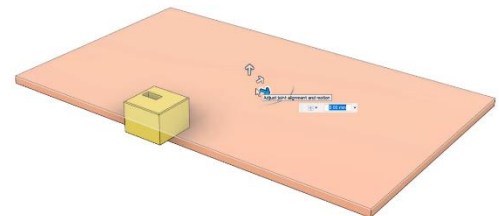


Figure 11. Test motion of Planar joint

- 12.** Hide the Planar component and show the Pin-slot component. Apply a Pin-Slot type joint by selecting the base of the small boss on the block as the first Snap reference.

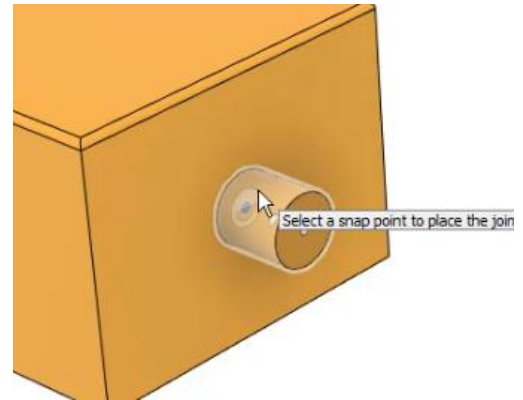


Figure 12. Define Snap reference for Pin-Slot joint

- 13.** For the second Snap reference, hover over the face of the plate hold down the CTRL/CMD key. Select the center position at the arc of the slot.

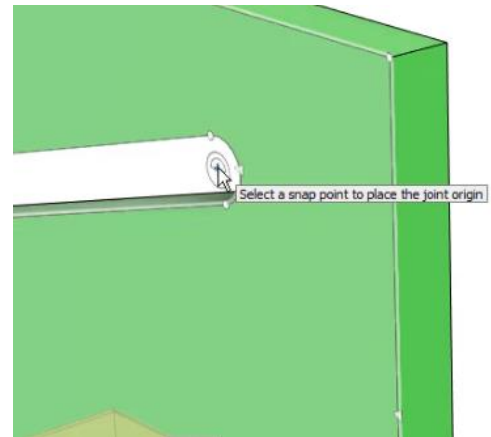


Figure 13. Define second reference for Pin-Slot

- 14.** Navigate to the Motion tab in the Joint dialog and set the Slide option to Custom.



Figure 14. Adjust the Motion parameters

15. Select one of the edges of the slot as the custom slide axis and test the motion.

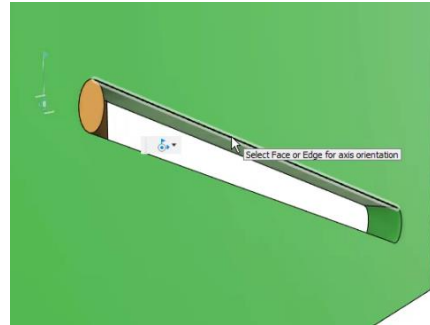


Figure 15. Verify Pin-Slot joint motion

16. Save the design.

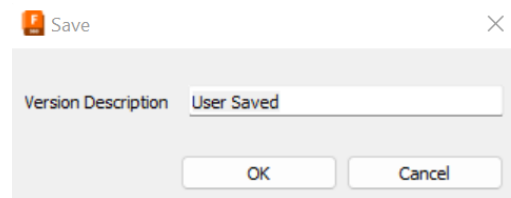


Figure 16. Save