

EDU[**CAD**]TION **STUDY GUIDE**

How to Create Assemblies in CAD with Joints

Chapter 2, Lesson 2

SendCutSend

Why Use a Separate Assembly File

- Rather than building everything around the original part (like the Arduino), creating a separate main assembly file allows for cleaner organization.
- This approach lets you reuse parts across multiple assemblies without duplicating work or introducing errors. Each component can be referenced independently while still maintaining links to its original design file.

Inserting the Component

- To begin, open your new main assembly file. Under '**Insert**', you'll select '**Insert Component**' and select the reversed-engineered Arduino file (see Figure 1.1). This brings the board into your workspace.
- The component appears as a linked file, meaning changes made to the original Arduino file will automatically update here unless you choose to break the link.
- Once a component is inserted, you can right-click the '**Component**' in the '**Browser**' and select '**Break Link**' to manage its connection or grounding. (see Figure 1.2).
- Selecting '**Unground from Parent**' in the same dropdown, allows the component to move freely, preparing it for alignment. **Note:** *Keep in mind that ungrounded objects can float or shift, so joints are necessary to maintain structure and alignment.*

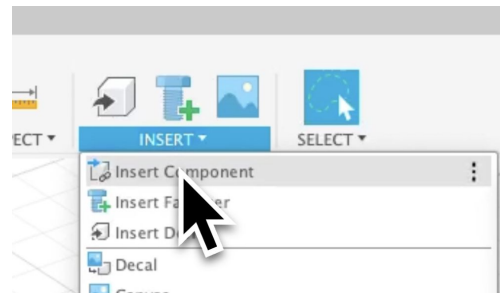


Figure 1.1

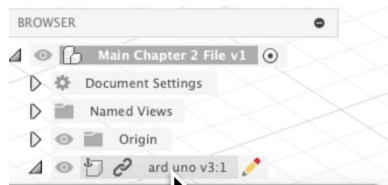


Figure 1.2

Understanding Joints

- The '**Joint**' feature, found under '**Assemble > Joint**' (see Figure 1.3) creates relationships between components. Each joint defines how parts connect, either fixed or with controlled motion.
- After selecting Joint, a dialog box will appear where you can choose the joint type and set its position (see Figure 1.4).
- The most common joint type is '**Rigid**' which locks components together like glue. Other joint types, such as '**Slider**' or '**Ball**' introduce motion but maintain positional relationships.

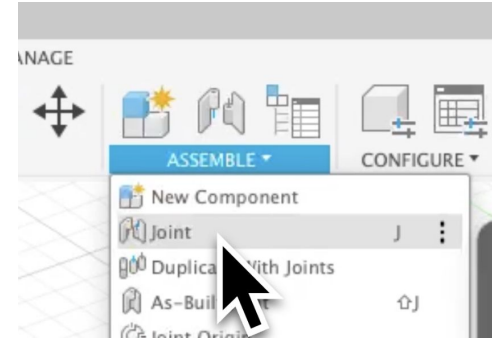


Figure 1.3

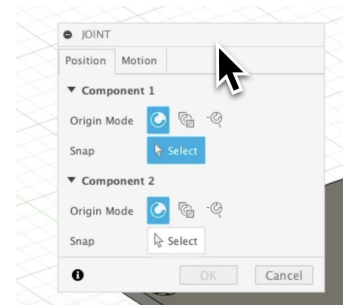


Figure 1.4

Creating a Rigid Joint

- To create a '**Rigid**' joint, first select a reference point on your component, such as the '**bottom center of the Arduino board**' (see Figure 1.5) and then select a corresponding point on the '**assembly's origin plane**'. Once you've chosen the bottom center, the Arduino will appear greyed out, indicating that no additional points can be selected.

Note: If you can't see the origin, ensure the eye icon next to Origin in the Browser is turned on.

- This locks the Arduino in place, ensuring it's positioned accurately within your assembly. After applying the joint, the component can no longer move freely (see Figure 1.6).

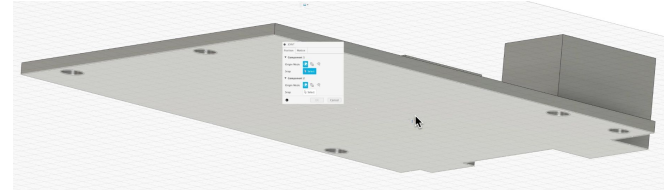


Figure 1.5

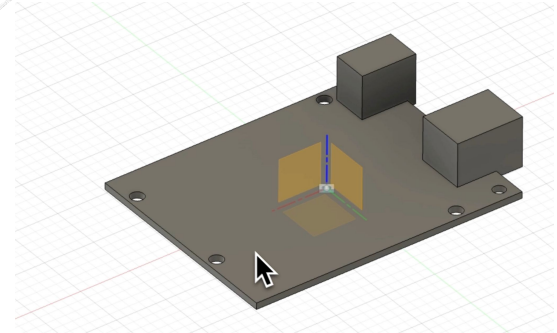


Figure 1.6

Editing and Managing Joints

- Joints can be modified at any time through the '**Timeline**' or the '**Browser Tree**'. In the '**Tree**', you'll see that a relationship has been created, this is where you can edit or adjust your joints (see Figure 1.7).
- These '**Relationships**' establish structure within your assembly and provide precise control over how parts interact.

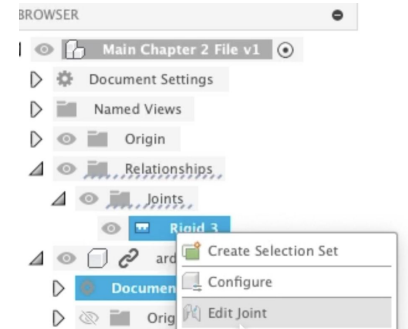


Figure 1.7

Summary

The '**Joint**' tool is essential for building well-structured assemblies. It defines how components interact, whether fixed or moving, and ensures everything aligns properly. By mastering joints early, you'll create organized, adaptable projects that scale easily as your designs grow more complex.

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