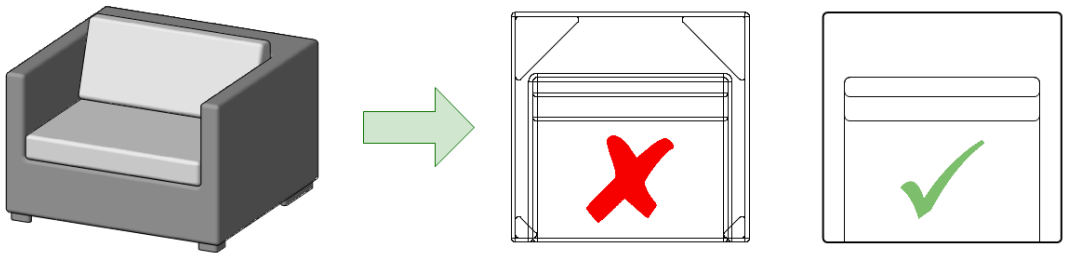
HYBRID 2D/3D SYMBOLS

Vectorworks Tutorial by Andy Broomell © 2020.
Green text indicates advanced or supplementary notes.

1 HYBRID SYMBOLS OVERVIEW

- A **2D/3D Symbol** is a Symbol that has both a 2D component and a 3D component ("hybrid").
- Vectorworks will automatically display only the 2D component when in Top/Plan, and only the 3D component when in any other view.
- Hybrid Symbols are necessary because a properly drafted 2D representation of an object is different than how the 3D model looks in wireframe.

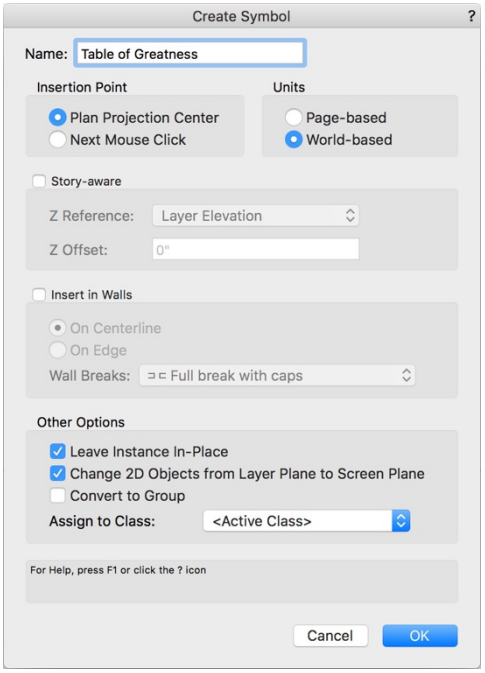


- The **2D Component** of the hybrid Symbol consists only of planar objects set to Screen Plane.
- All 3D objects, plus any planar objects set to Layer Plane, go to the **3D Component** of the Symbol.

2D COMPONENT	3D COMPONENT
Screen Plane objects	Layer Plane objects (a.k.a. Symbol Definition) 3D objects

2 Creating a Hybrid Symbol

- When creating a Symbol, you can start with just the 2D part, just the 3D part, or both parts together, depending on your workflow and where you are in the process. In this example we'll make both components before defining the Symbol.
- Say you've already created a 3D model of a rectangular table. Go to Top/Plan, then draw a Rectangle (Screen Plane) that snaps to the corners of the table. This will be the 2D representation of the table.
- Select both the 3D table and 2D rectangle, then go to **Model > Create Symbol** (note shortcut).
- Give your Symbol a name, and ensure the other options are what you want (see Insertion Point tips on next page). Click OK.



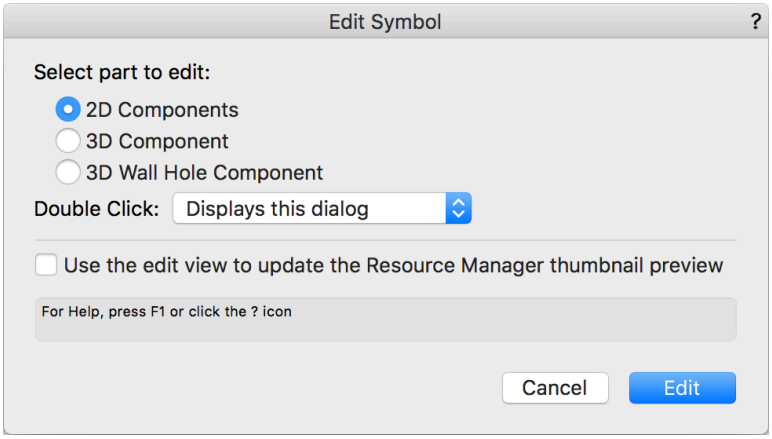
- The resulting object is called a **"2D/3D Symbol"** in the OIP. This is a hybrid Symbol. Vectorworks has automatically parsed out the objects to the correct components of the symbol.
- Note that 3D Symbols and hybrid Symbols have a **"Z" value** in the OIP. This is very useful to determine the Symbol's vertical position, and is in reference to the insertion point of the Symbol.
- In the Resource Browser, note that 2D-only Symbols have a ⧉ in the lower right-hand corner, 3D-only Symbols have a ⧈ in the lower right-hand corner, and hybrid Symbols have no number.

3 Defining the Insertion Point

- Defining the **insertion point** of a Symbol is a bit more complex when working with 3D objects since there is a third dimension involved.
- **If you are in Top/Plan when you Create a Symbol**, the Symbol's Insertion Point will be always end up on the document's ground plane (+0 on the Z axis), regardless of where your object is located in space on the Z axis.
  - **"Plan Projection Center"** means it'll automatically find the center of your objects on the XY plane (and the Z will be on the ground plane).
  - **"Next Mouse Click"** means you can choose where on the XY plane you want the insertion point once you click OK. The Z will be on the ground plane.
- **If you are in a 3D view when you Create a Symbol**, the insertion point "Z" doesn't automatically default to the ground plane. Instead:
  - **"3D Object Center"** means it will find the center of the object(s) in all three dimensions. This is usually not recommended since it results in the insertion point being inside the object rather than on its bottom surface.
  - **"Next Mouse Click"** allows you to set the insertion point exactly where you want (on all three axes) by clicking and snapping to a snap point on your object . (It will automatically switch you into Layer Plane so that it's snapping correctly in all three dimensions).

4 EDITING A HYBRID SYMBOL

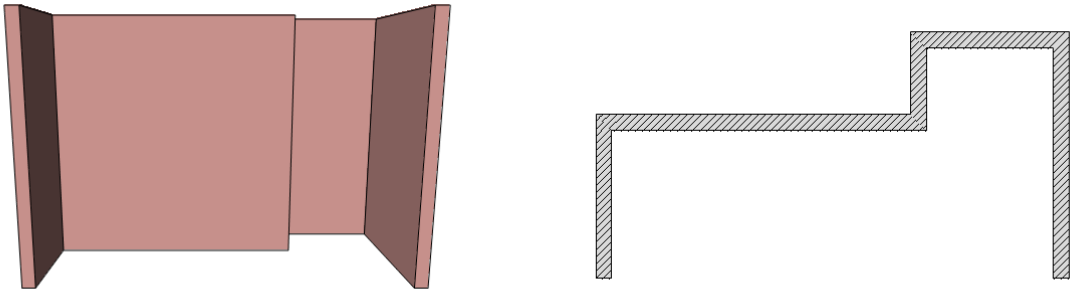
- **Double-clicking** a Symbol will present you with a pop-up where you can choose whether you want to edit the 2D Components or the 3D Component.



- You can move planar objects back and forth between the 2D side and 3D side by switching their plane between “Screen” and “Symbol Definition” (which is like Layer Plane).
- Note that the two sides of the Symbol are completely independent – moving or changing a 2D object will not change the 3D object, so you have to ensure you keep the two sides **cohesive**.
- If you started with only the 2D component or only the 3D component, simply adding in the other side will make it a “hybrid” Symbol.
- As of VW2019 there are new functions regarding 2D components for all orthographic views, plus ways to generate the 2D geometry from the 3D model. This is *in addition* to how hybrid symbols already work.
- Note that if you have an instance of a hybrid Symbol and run the **Convert to Group** command, the resulting Group will only contain the component of the Symbol you currently see on your screen.

5 PLUG-IN OBJECTS

- Many of Vectorworks' built-in tools create **Plug-In Objects (PIOs)** that are automatically hybrid, meaning the parameters in the OIP create both the 2D and 3D representation of that object.
  - A few examples include:
    - Wall tools
    - Door & Window tools
    - Staging tools



3D VIEW TOP/PLAN

- These objects don't have to be saved as a Symbol (though they *can* be if it's helpful to your file workflow). The tool itself is hybrid.
- Note that sometimes it may be easier to model an object from scratch if the Plug-In Object doesn't have the parameters needed to create exactly what you want. For example, the door and window tools are great for early design phases, but may need to be replaced with custom-created symbols when more detail is needed.