EDU[CAD]TION **STUDY GUIDE**

How to Navigate the CAD Workspace: Origins, Axes, and Planes Explained

Chapter 1, Lesson 3

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What are origins?

- The origin in CAD is the reference point in 3D space, marked as X=0, Y=0, Z=0. It functions like a GPS coordinate system, serving as the 'home base' for all geometry.
- In Fusion, the origin can be shown or hidden using the visibility toggle (eyeball icon).

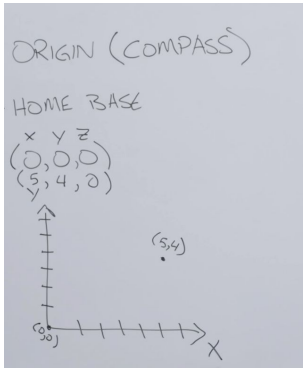

Figure 1.1

What are axes and planes?

- From the origin, three perpendicular axes (X, Y, Z) extend at 90° angles.
- These axes define planes, which act as flat surfaces for sketches. - XY Plane: formed by X and Y axes. - XZ Plane: formed by X and Z axes. - YZ Plane: formed by Y and Z axes.
- Analogy: Think of a room. The floor and walls represent planes, while the corners where they meet represent the axes.

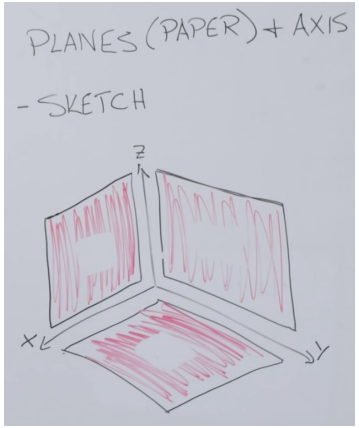

Figure 1.2

How to display the origin, axes, and planes

- In Fusion, these elements are often hidden by default.
- If the eyeball is greyed out, that means it's in hide mode. (see figure 1.3)
- Click the eyeball, it will turn dark, and that allows you to start seeing which ones you want to. (see figure 1.4)

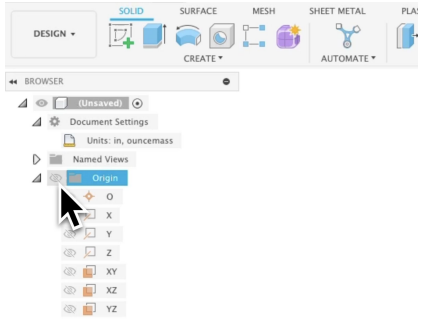

Figure 1.3

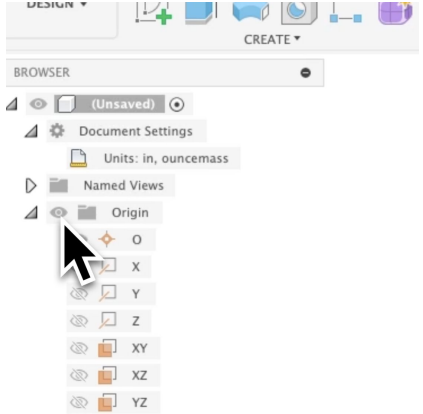

Figure 1.4

Toolbar and Sketching

- Before sketching, turn on the axes and reference planes you'll need. Once they are visible, you'll see three axis lines extending from the origin, and the selected planes will highlight in yellow (see figure 1.5)
- The toolbar at the top of the workspace is where you create sketches and features. (see figure 1.6)
- To begin sketching, click create sketch and select a plane (XY, XZ, or YZ). For simple parts, the choice of plane is flexible.
- Later, in assemblies, selecting the correct plane becomes more important for orientation.

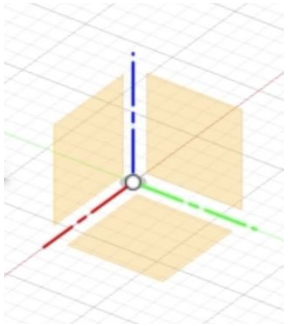

Figure 1.5

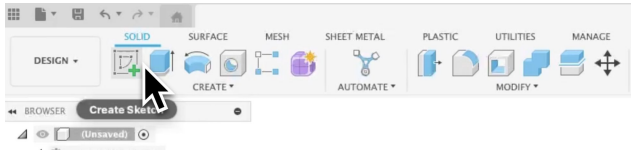

Figure 1.6

View Cube and Navigation

- The **'View Cube'**, located in the top-right corner, allows you to reorient the model interactively. You can click on faces (Front, Top, Right, etc.) or edges to rotate the view. (see figure 1.7)
- The **'Home button'** next to the view cube restores an isometric (ISO) view centered on the origin if you get lost. (see figure 1.7)

Figure 1.7

Other tools available

- Use the '**Pan'** tool, located at the bottom of your screen, to move your view. Click and hold the left mouse button, then drag to shift the model back and forth. (see figure 1.8)

Figure 1.8

- Select the '**Zoom'** tool to adjust your view. Click and hold the left mouse button, then move the mouse forward or backward to zoom in and out. (see figure 1.9)

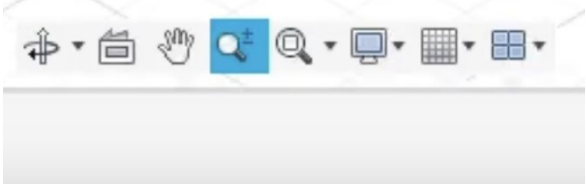

Figure 1.9

Mouse Controls

- Scroll wheel: zoom in/out.
- Click and hold scroll wheel: pan view.
- Shift + scroll wheel: rotate view.
- Left click + drag: interact with selected tools (e.g., sketch shapes).

Summary

Mastering the workspace is the first step in CAD success. Understanding how to use the origin, axes, and planes ensures precise sketches and models. Navigation tools like the View Cube and mouse controls allow you to efficiently manipulate your view, helping you stay oriented and productive as you progress into more complex modeling tasks.

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