

Chapter 1: Understanding Scale

How to Read and Draw Architectural Plans: the Basics

In order to make a model of a specific space or object, you must first start with dimensions. If you are working with a specific space, you may find yourself looking at architectural drawings. There are certain standards by which these measurements are depicted in architectural drawings that are helpful to know.

Let's start by looking at a model of a room.



This model is of an ordinary room that has 4 walls, a ceiling and a floor.



To represent these different planes in a drawing, we can examine each of these surfaces individually, and note how they fit together.

You may notice that there is one wall missing: this is because this model was meant to be viewed from one side. There are many ways to negotiate the viewing angle, and removing a wall is not always the best solution. For this tutorial we will focus on models that have one wall removed for the sake of simplicity.

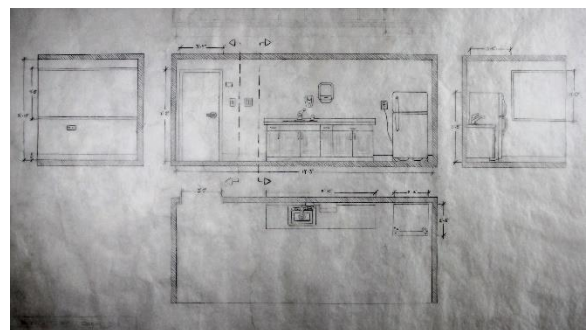


The perspective of a room when looking down is called the "ground plan," or sometimes simply "the plan."



The perspective of looking straight on to the back wall is called the front elevation in theater or a section in architecture.

The difference between the front elevation and the section is that the front elevation is always of the wall facing front, such as the flats in a theater set, whereas the section can be a slice along any plane. For this introductory tutorial, the distinction is not important, and we will refer to all walls as sections.



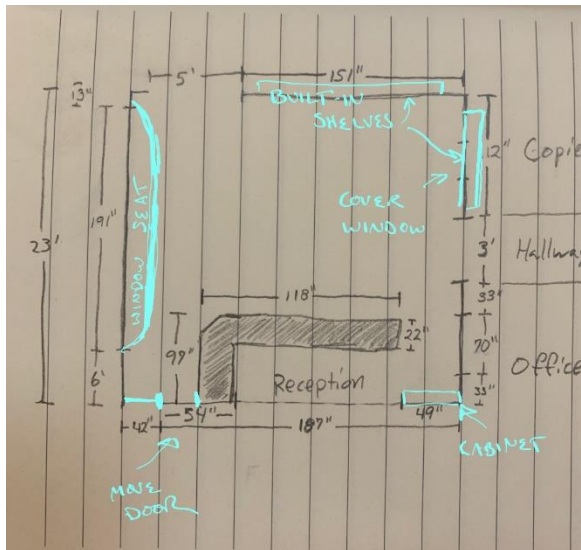
This is a set of to scale drawings that depicts the kitchenette portion of a small room. This is one of the 1st to-scale drawings I ever completed.

Here are the front elevation, the side sections and the ground plan. You can see that the sink in the ground plan matches up with the sink in the section, and that the fridge in the front section matches up with the fridge in the side section

Each section comes together with the ground plan to make a 3 dimensional picture in the same way that the surfaces of the model comes together to make a 3 dimensional room.

DIY Dimensions

There are a lot of situations in which you will need to measure a pre-existing space yourself before or during your artistic process. Galleries, theaters and other venues generally have ground plans on hand for artists, but there is a lot of variance when it comes to detail. Depending on the work you wish to install, you may need to do some measurements on your own. For example, you may need to know exactly where the outlets are, or the location and dimensions of a column. Or you may be working in a space for which there are no plans, and you have to start from scratch.



While measuring, it is helpful to make a simple napkin sketch of whatever plane you are measuring. This is an example of a napkin sketch that was provided to me by a collaborator. Don't worry about making this sketch pretty, it only matters that you can read it later. As you go along, write the measurements that correspond to

each section of the architecture. Once you have these measurements, you can either convert the sketch to a to-scale drawing or start working directly with the model, depending on your preference.

How to Scale

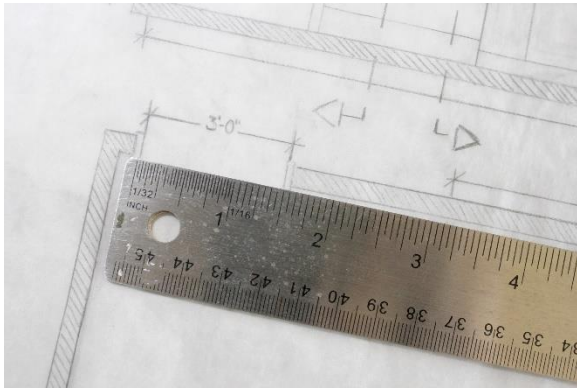
What does it mean to do something to scale? Unlike the napkin sketch, which shows the general shape and the corresponding measurements, a to-scale drawing or model is proportionally accurate. This means that you can take a ruler and measure part of the drawing or model, and the measurement will directly correspond to the measurement of the real-life object when you multiply by a given number.

For example, **1 inch scale means that 1 inch in the drawing or model equals 1 foot in real life.** This is the easiest scale to understand, because multiplying by 1 always yields the same number.



For example, this model is in 1 inch scale. When we measure in the model, we can see that the length of the room is 12 inches. This means that the actual room is 12 ft.

Likewise, **1/2 inch scale means that 1/2 inch in the drawing or model equals 1 foot in real life.**

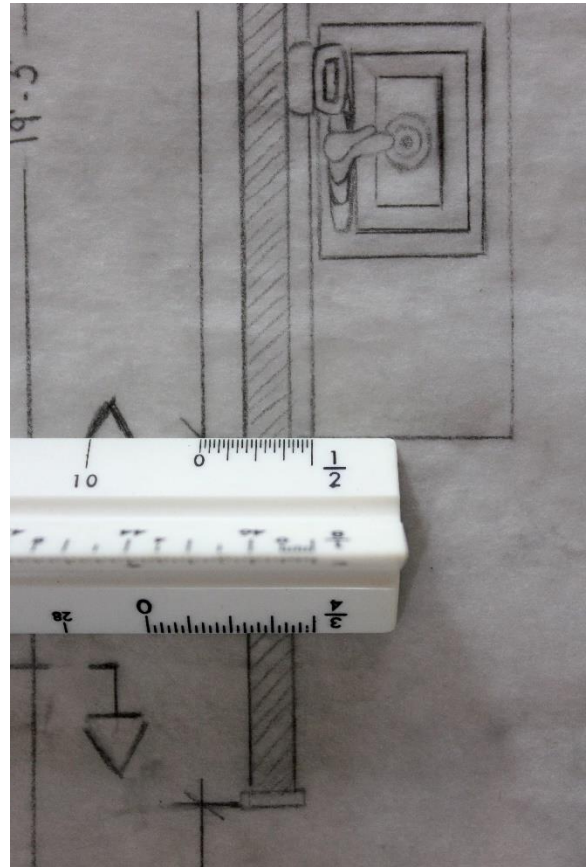


If we return to the original drawing, we can see that this drawing is in $\frac{1}{2}$ inch scale. In the drawing, this doorway is 1 and $\frac{1}{2}$ inches wide.

There are 2 half inches in each inch. So this drawing tells us that 1 and $\frac{1}{2}$ inches equals 3 feet. Multiply by 2 to go from the drawing to real life. Divide by 2 to go from real life to either the drawing or the model.



Multiplying by 2 is straightforward, but even that can be tiresome when you are working with inches rather than feet. An Architect's scale rule is a tool that makes it easy to skip the math: simply use the side of the ruler that corresponds to the scale you are working in just like you would a regular ruler to read the number of inches on the drawing or model.



You can see here that the lip of the countertop in this drawing is 1 $\frac{1}{2}$ inches

Which Scale do you pick?

There are many different scales, such as $\frac{1}{4}$ and $\frac{3}{8}$, that follow the same principle as above. Which you choose is largely a matter of preference. Often the scale is selected in order to make the model or drawing a desirable size. Larger spaces will require smaller scales whereas smaller spaces can conveniently be drawn in larger scales which show more detail. Choose whatever scale is practical for your purposes.



When drawing to scale, you will want to use a ruler both to measure and to draw nice, straight lines. You may also want to use a square and/or a triangle in order to make sure your angles are right. Alternatively you can draw on graph paper for accuracy.

Suggested Technical Exercise

Materials needed: ruler, pencil, paper, tape measurer

It is not necessary to make a to-scale drawing to make a to-scale model, but doing so will help you to understand scale. It will also help you understand how to read drawings of existing spaces that you may want to model.

Pick a room in your home to measure. Make a casual "napkin" sketch of the ground plan and at least one wall. Replicate this sketch to-scale in either 1 inch or $\frac{1}{2}$ inch scale.