

Introduction

Hey there! Serum here.

First of all I want to thank you for purchasing my real world cameras. It's support from people like you that allow me to live the creative life that I now live.

Outside of being a 3D artist on Daz I am a professional photographer and have been for over 15 years at this point.

As you can imagine I have a lot of lenses for my cameras!

Each and every lens has a specific use and some work better for certain situations than others.

Unfortunately out of the box Daz does not come with what i would refer to as real world lenses.

Instead daz provides a suite of tools for you to craft your perfect lens.

That is where i decided i would fill the gap because as a working professional photographer I like to reach for my favorite lens and so i wanted the same for when i am using Daz.

And such I have created a collection of real world cameras that I can reach for when creating my renders.

At first it is a little fiddly to get to grips with but keep at it eventually the process becomes second nature. (much like photography)

How real cameras work.

Cameras really have not changed that much over the past 100 years but in basic the way that the camera works is light hits various surfaces and bounces off surfaces then goes into your lens which is then focused onto either a sensor or film.

In rendering it's essentially the same process but the direction of light is reversed.

So in the case of 3d rendering we start with the sensor and the rays shoot through the lens and then bounces around the scene until it finds a light source.

It's okay you didn't need to know that but the overview gives us a good place to start.

Camera Formats

There are many types of cameras out there but the majority fall under these 3 categories which are denoted by their format type.

- **Full Frame-** These are the most common type of camera out there and are denoted with a sensor size of 36mm across. Most professional cameras tend to be Full Frame as such I have created the most options for this category.
- **Medium Format-** These cameras have a larger sensor to capture the information usually around 6-7cm which give a wider field of view than the full frame cameras.
- **Large Format-** These are the big cameras that you will have seen where they often have large bellows and often the photographer would be under a cloak behind the camera. The capture medium on these cameras is measured in inches because the sizes can be quite large.

Lens Types

There are many lens types out there all denoted by their size in millimeters.

For this Example I will stick with assuming that the camera we are using is a Full Frame camera.

The lens types fall into 4 Categories that are provided in the collection.

- **Wide Angle Lenses** - These lenses have a wide field of view and let in a lot of the scene and fit it onto the sensor. Sometimes that angle can be so wide that when all of that information is presented to the sensor it can be distorted due to the curvature of the lens. This effect may be wanted or not wanted depending on the shot. The centre of the image will be less distorted than the outer edges so it is advised to have your subject placed more central on lenses with distortion. Common Wide angle lenses which are included in the collection are as follows: 16mm, 24mm, 35mm. The way to know which is the wider angle is the smaller the number the wider the angle.
- **Normal Lenses**- These lenses have little or no effect on the field of view. As such they are meant to mimic what the human eye sees without zooming in or distorting to fit in more of the scene and are incredibly useful for a more natural look. Lenses in this Category which are included in the collection would be the 50mm and 59mm lenses
- **Telephoto Lenses**- These are classified as any lenses that have a smaller field of view than a normal lens. In short what that means is that they cover less of the image than a normal lens. The effect of this is that the telephoto lenses fit less onto the sensor than the normal or wide angle lenses but because the image still fills the sensor this has the effect of zooming in. The way to determine how zoomed in is to look at the millimeter size which works in the opposite way to the wide angle lenses. The higher the millimeter the more “zoomed in” the image. Lenses included in the collection: 85mm, 105mm, 120mm, 150mm, 200mm.
- **Portraiture lenses**- These lenses are specifically crafted for shooting living subjects and include all of the previous types of lenses but have been designed to be as flattering as possible.

Let's Talk Compression

You may or may not know this but all lenses have an artifact called compression.

Compression is kind of what it says on the tin in that the scene is compressed.

What I mean by that is the background that is behind your subject can be made to look closer or further away than it really is.

Wide angle lenses will push the background further away whilst telephoto lenses will bring the background closer literally compressing the image.

This is something that the photographer takes into account and it becomes an artistic choice.

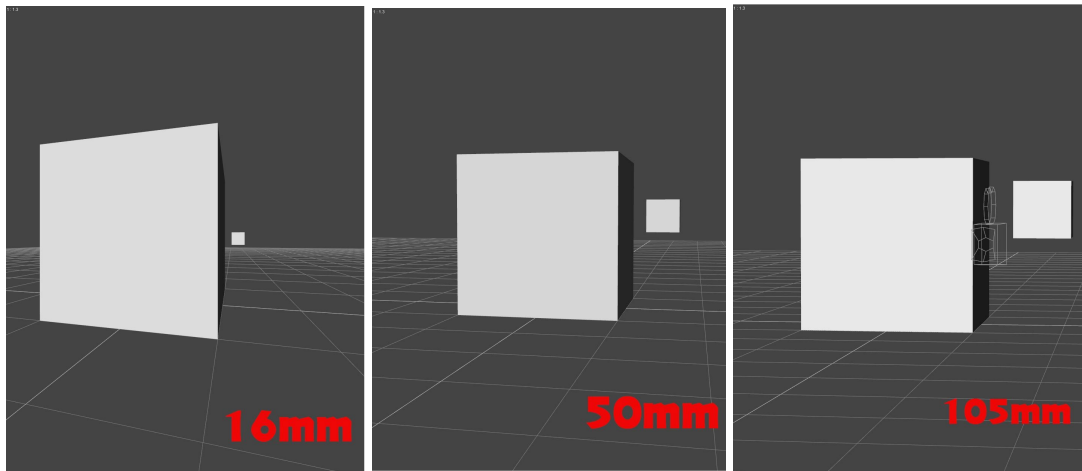
Let's put this into practice.

Take a look at the example below where I have placed 2 cubes into a Daz scene.

The closer cube in this example is our subject and the cube further away will be our background.

The cube positions do not change only the camera positions so they all roughly have the front cube at the same size across all three images.

Look at the rear cube and the differences between a Wide angle lens, A normal Lens and a Telephoto Lens.



As you can see above the more wide angle the further back the background appears to be whilst the more zoomed in you are the background appears closer to the camera.

Aperture Blades and Bokeh Balls!

Aperture

Inside each real world lens is a series of blades called the Aperture. What this does on a real world camera is control the volume of light hitting the sensor but this is not something we will concern ourselves with as we have other ways in Daz of controlling how bright the image is. Instead we will concentrate on the other function of the Aperture which is to control our Depth Of Field (DOF) which is essentially how much of our scene is in focus from the camera to the background.

Aperture settings are represented by an Fstop number such as F5.6, F8 etc.

The way it works is the higher the number the more things that will be in focus.

Conversely the opposite is true the lower the number less things will be in focus.

What you choose is all artistic choice.

Here are some examples below of our cube in a scene with a HDRI Background. Notice how the background changes as the Aperture is opened up wider.

This is a powerful creative way of separating your main subject from the background or including the background.

It's different with different lenses and distances!

There is no set amount of space that will be in focus; it changes between lenses and distance to the subject.

This is why photographers have so many lenses to provide those creative choices to get the shot.

Here is the key to aperture use.

- The closer to the subject the camera = less area that will be in focus at any F Stop
- The further away from the subject the camera = more area will be in focus at any F Stop
- The more Telephoto the lens = The less area that will be in focus at any F Stop
- The more Wide Angle the lens = The more area will be in focus at any F Stop

What this ends up meaning is you may need to choose between the lenses you have in order to achieve the right balance of what is in focus or not.

Aperture Demonstration.

16:9



50mm Lens F1.8

16:9



50mm Lens F8



It's all about them Bokeh Balls!

Wikipedia describes Bokeh as “**bokeh** ([/ˈboʊkə/ BOH-kə](#) or [/ˈboʊkeɪ/ BOH-kay](#);^[1] Japanese: [\[boke\]](#)) is the aesthetic quality of the blur produced in the **out-of-focus** parts of an image produced by a **lens**. Bokeh has been defined as “the way the lens renders out-of-focus points of light”.^[5] Differences in **lens aberrations** and **aperture** shape cause some **lens** designs to blur the image in a way that is pleasing to the eye, while others produce blurring that is unpleasant or distracting (“good” and “bad” bokeh, respectively).^[6] Bokeh occurs for parts of the scene that lie outside the **depth of field**. Photographers sometimes deliberately use a **shallow focus** technique to create images with prominent out-of-focus regions.”

Translated this means the pretty out of focus balls that you will see in images. it's usually where pinpoint of light are in the image which are out of focus which gives a pleasing look to the image.

The more open the aperture the more pronounced the bokeh.

Let's take the previous example to see the bokeh in the image.

We will use the F1.8 Aperture image and I will highlight those lovely Bokeh Balls for you.



Should they be that shape?

Well that is an artistic choice you have.

The shape of the bokeh is determined by how many aperture blades there are in the lens.

The standard lenses included with the real world lens collection are based on classic photography lenses which have 9 blades.

Luckily included with the collection are the portraiture lenses all of which have a massive 21 blades in to create a more circular bokeh.

See the difference below.



But why do I need to know all this?

In order to make the best choices for the camera you pull out of the bag you need to know how your choice affects the image.

Photography is all about balance and the effect of the sensor size works in conjunction with the lens and aperture

It's all your artistic choices

Some basic things below to remember about the artist choices you will be making .

- The Larger the format you choose the wider field of view (More Wide Angle)
- The Smaller the format you choose the more narrow the field of view (More Telephoto)
- The smaller the mm on a lens the wider the angle (Zoomed out)
- The higher the mm on a lens the more telephoto (Zoomed in)
- The smaller the mm on a lens the further away the background will look
- The higher the mm on a lens the closer the background will appear in your renders.
- The lower the Aperture number = The less things in focus
- The Higher the Aperture number = more things in focus

Conclusion

Wow that is a lot of information to take in but i wanted to give you a crash course so that you have a baseline of knowledge to draw from so that you can use this tool in such a way that you get the most out of your renders.

Introducing the lenses and supercam

The Real World Camera Collection comes in 2 flavours, The first of which is the supercam which you can effectively think of as a zoom camera containing all focal lengths and aperture settings that you can select from.

Secondly is the individual lenses which while similar to the super cam are just individual focal lengths with the aperture settings attached.

Simply load your choice into the scene and it will appear as its own entity separate from any other cameras in the scene.

This will not delete your existing cameras unlike the daz presets.

Setting up your workspace ready to use the cameras.

Having your workspace set up right is key to the tool being a productive asset.

There are some specific panes you are going to need in your loadout.

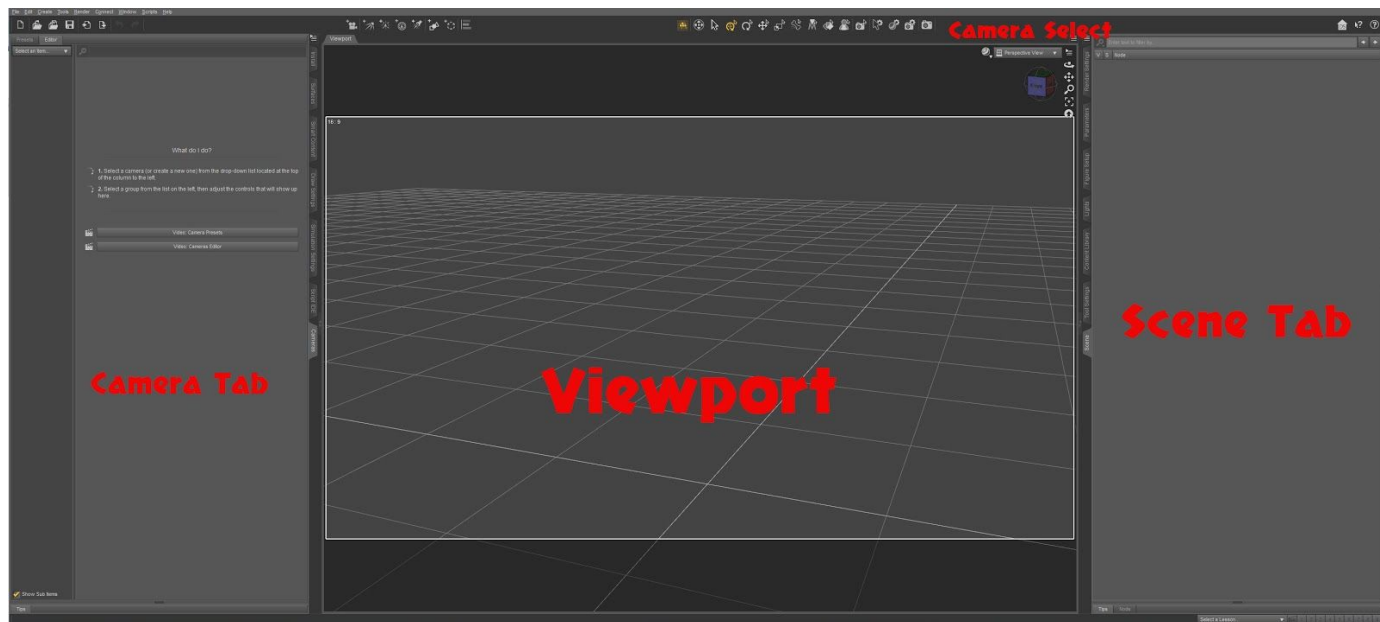
If you do not have any of the following then go to the top of the screen and go to Window - Panes(Tabs) and select the ones you do not have.

They will appear in their own window but personally I like to dock them by clicking and holding the tab and dragging it to where you want it.

The Tabs you are going to need are the following:

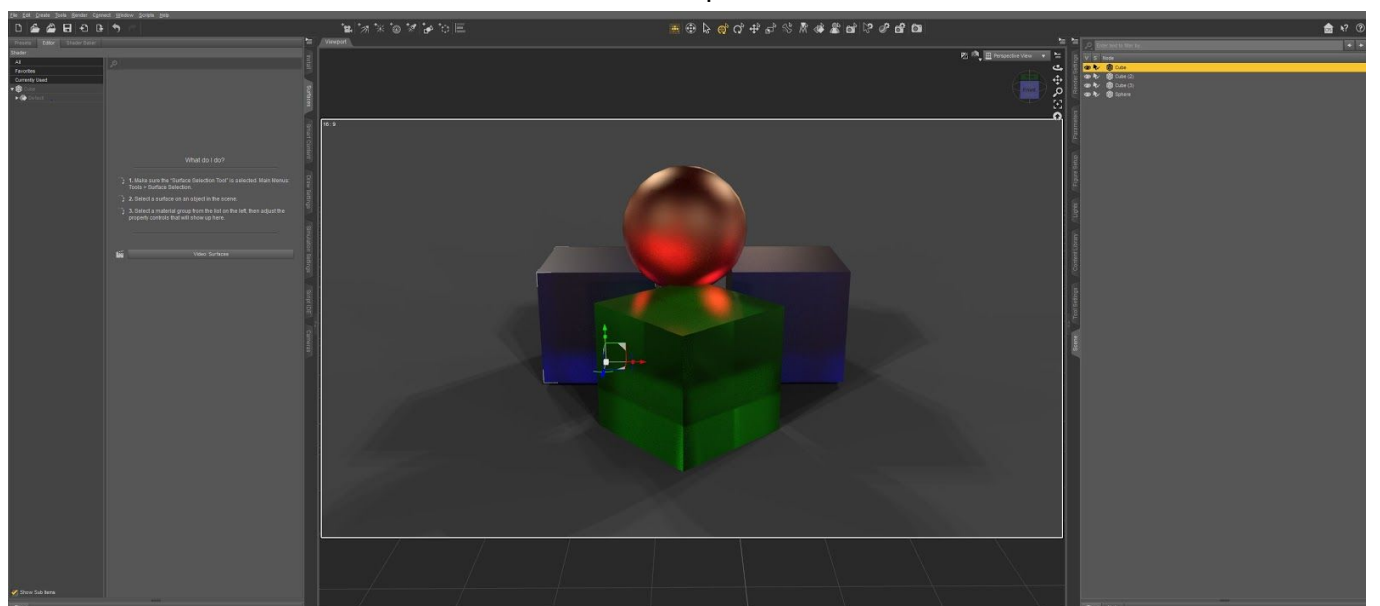
- Viewport
- Cameras
- Scene

Here below is how i choose to set my screen up. You may choose differently and that is fine.



And Just so we have something to render I will add a couple primitives (Create-New Primitives)

I added a bit of colour so here is our initial scene set up.



If you look at the scene tab you will see the items listed.

Using The cameras

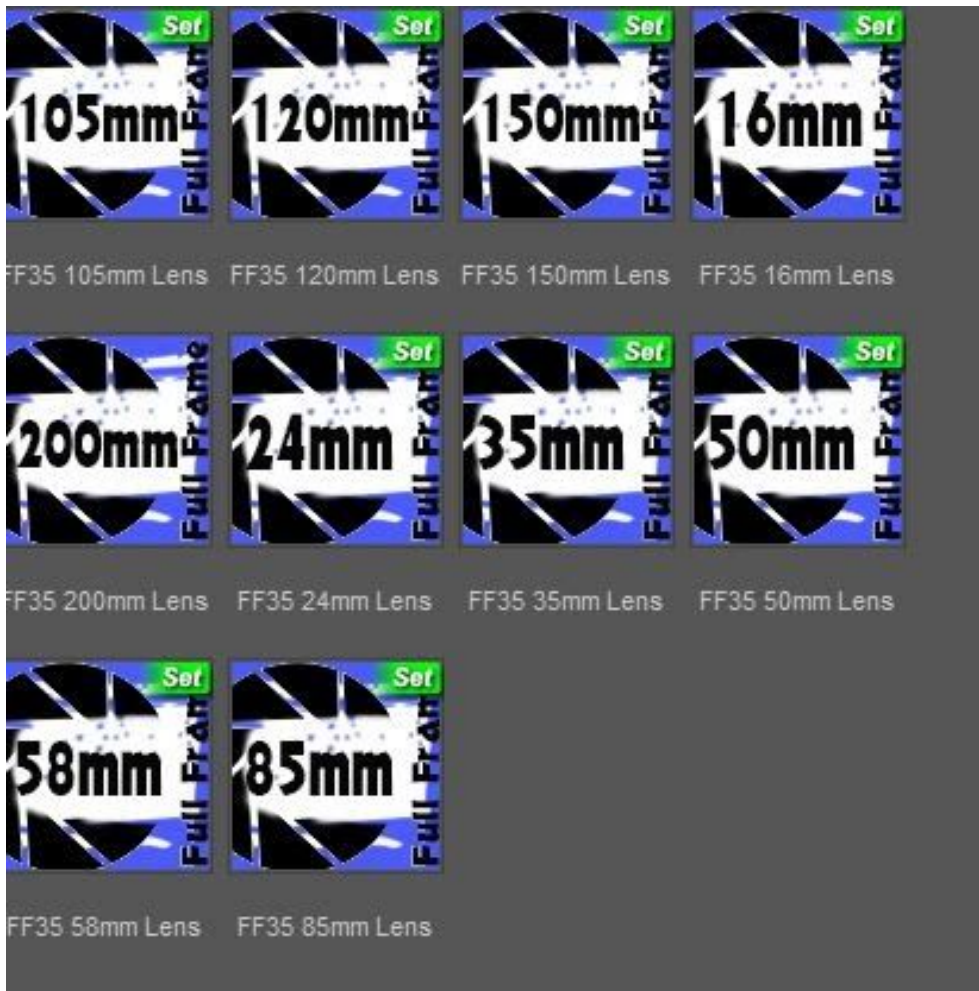
Let's look at the naming convention of the lenses before we add one to the scene.

As you will see below each of the Full frame lenses starts off with FF35 this part is telling us that it's a 35mm full frame camera.

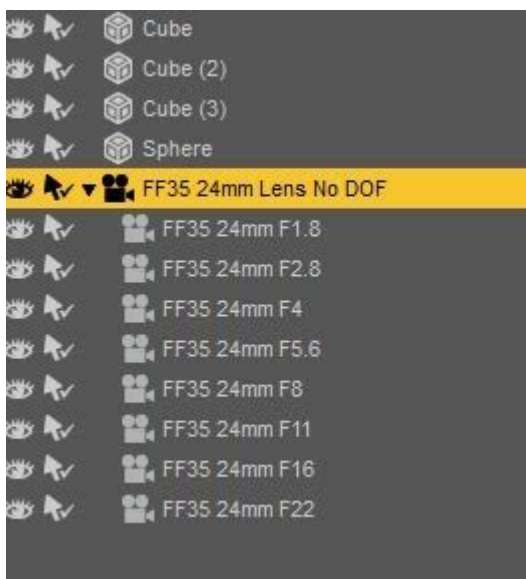
If it was a medium format camera it would start with MF645 which would be a 64.5mm camera.

For large format cameras it would start with LF5in which stands for Large Format 5inch.

Next up is the lens that is attached to the camera with the mm clearly shown in the icon.



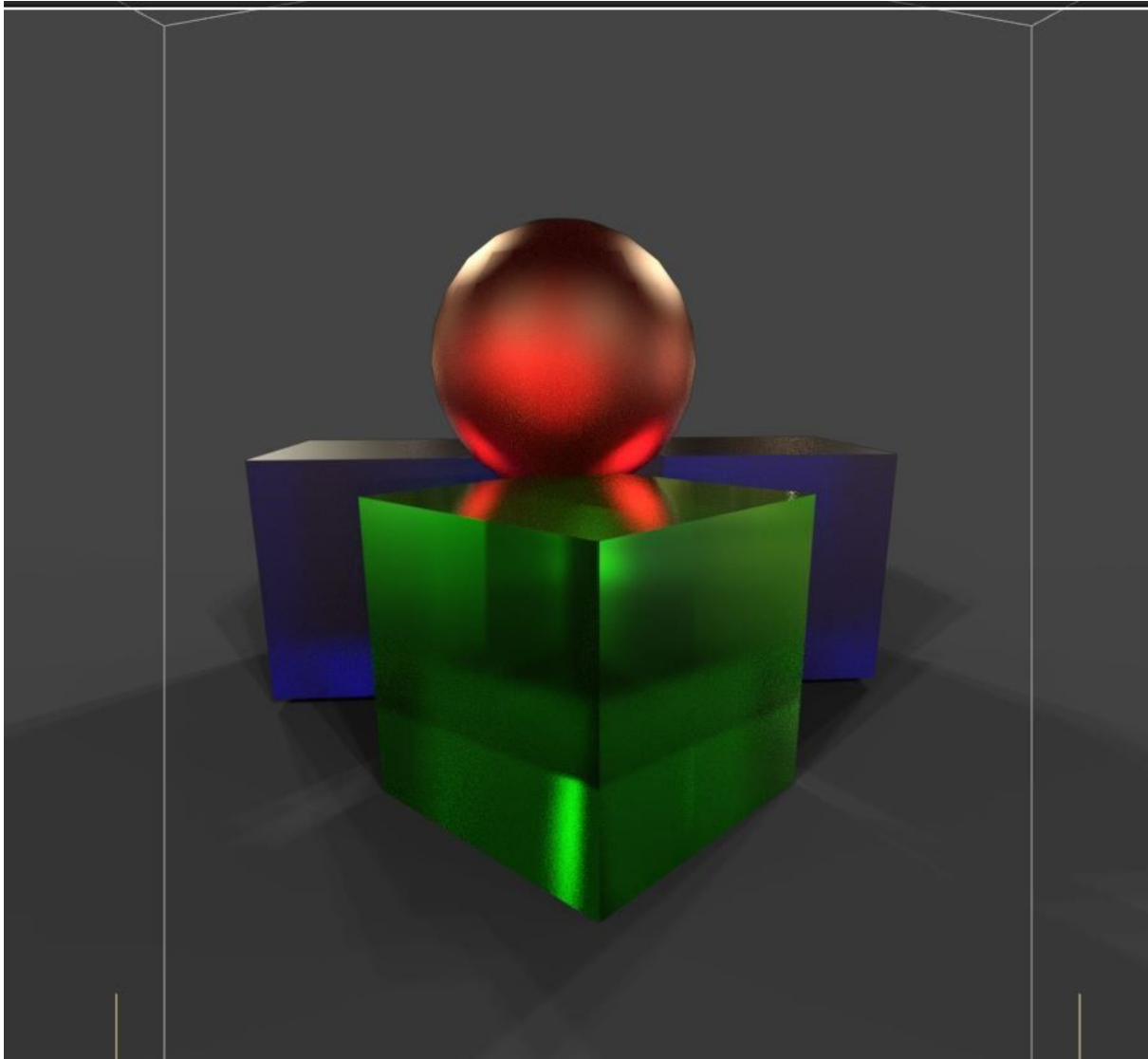
Okay let's add a camera into the scene in this case I will add a 24mm camera to the scene and it will look like this in the scene tab



As you can see there is a hierarchical structure for how the camera is set up with multiple cameras listed under it.

All of the cameras lower are locked to the top camera so when you have that top camera selected you can use it to position your camera how you want.

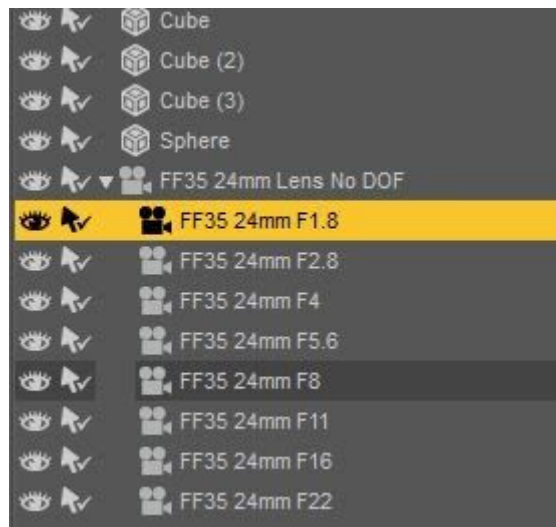
So now i will do just that by selecting the No DOF camera in the viewport and reposition the camera how i want.



Okay that's perfect so now we need to focus the camera as the No DOF camera has all of the depth of field turned off and is only the lens with no blur. (That could be what you want if so you can stop here)

How to focus the camera

_In order to make use of the depth of field settings we are going to need to focus the cameras.

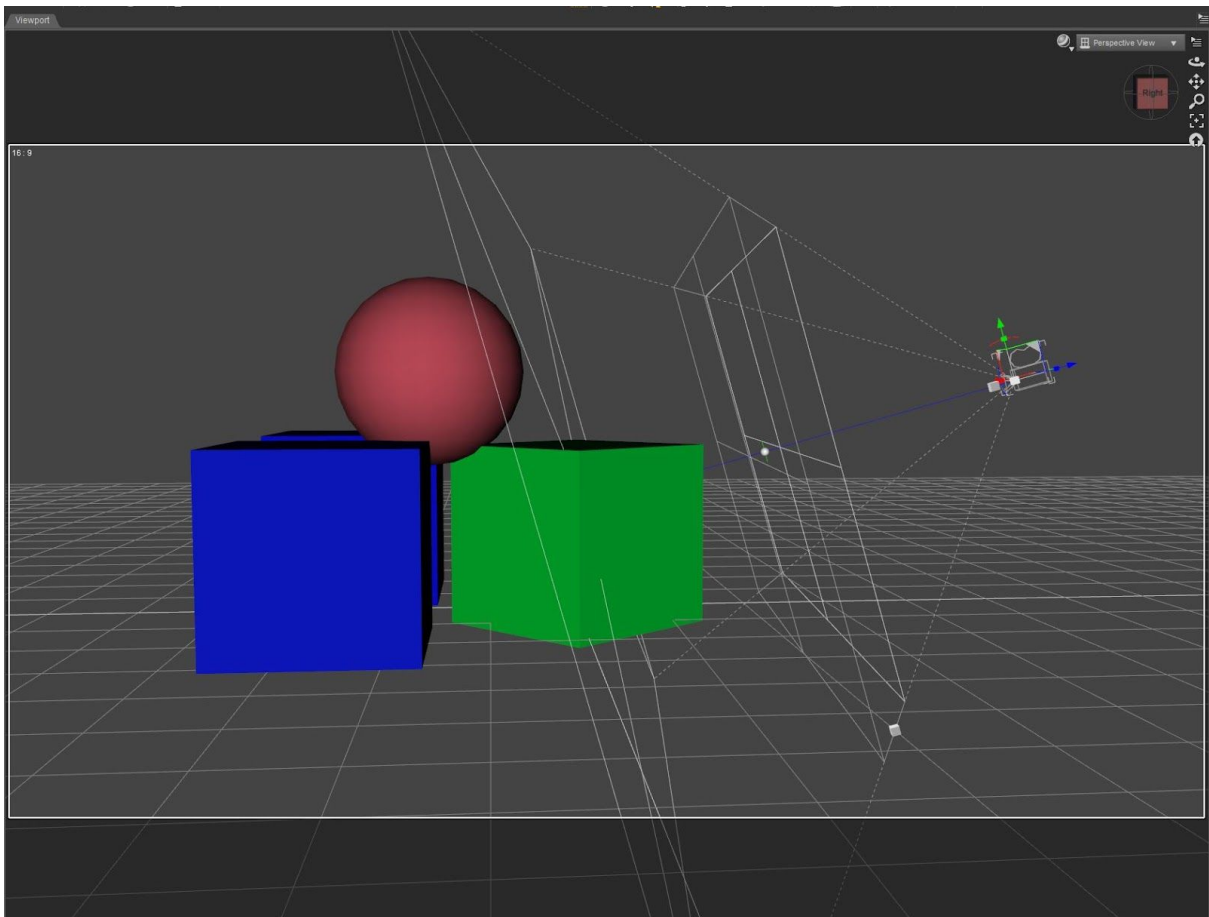


1 First step select the setting with the widest aperture in the scene view (it's always the first one after the No DOF Camera)

What this does is gives us the smallest possible slither of focus to work with.

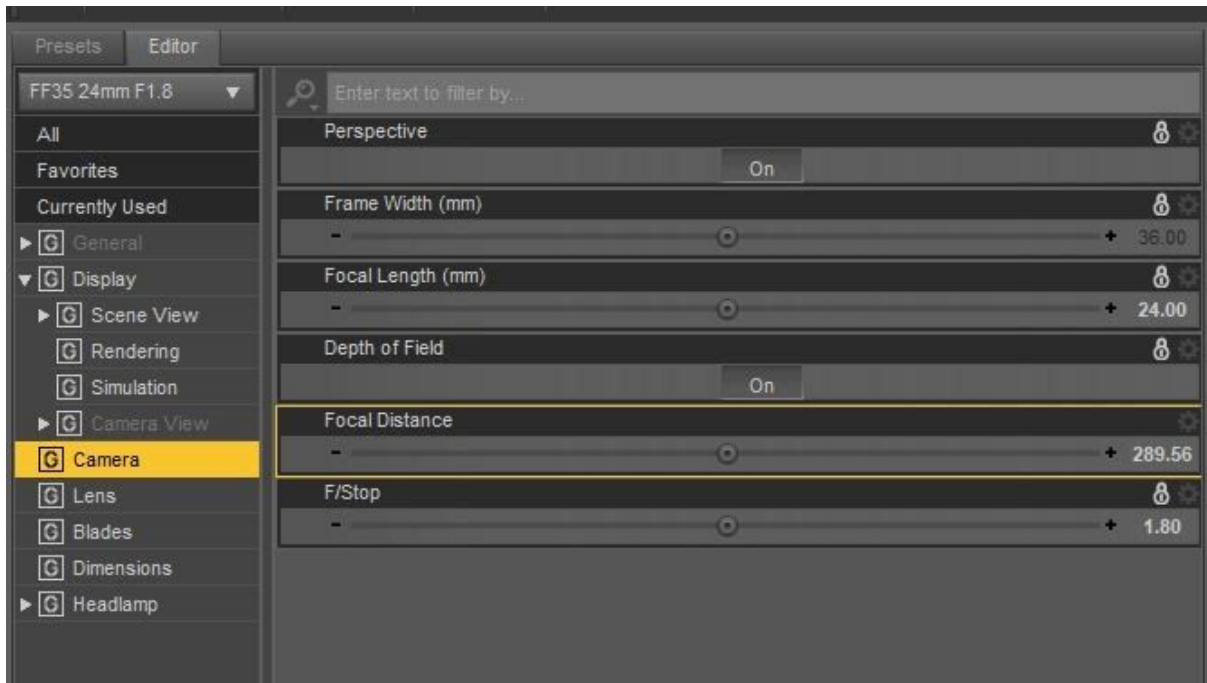
2 in the viewport select the perspective camera and point it from 90 degrees to the side of your subject.

Your scene should look something like this



As you can see the camera is also viewable in the scene with some lines coming from the camera. Now we get to set what to focus on.

3 go to the camera's pane and select the camera in the left view and look for Focal Distance.

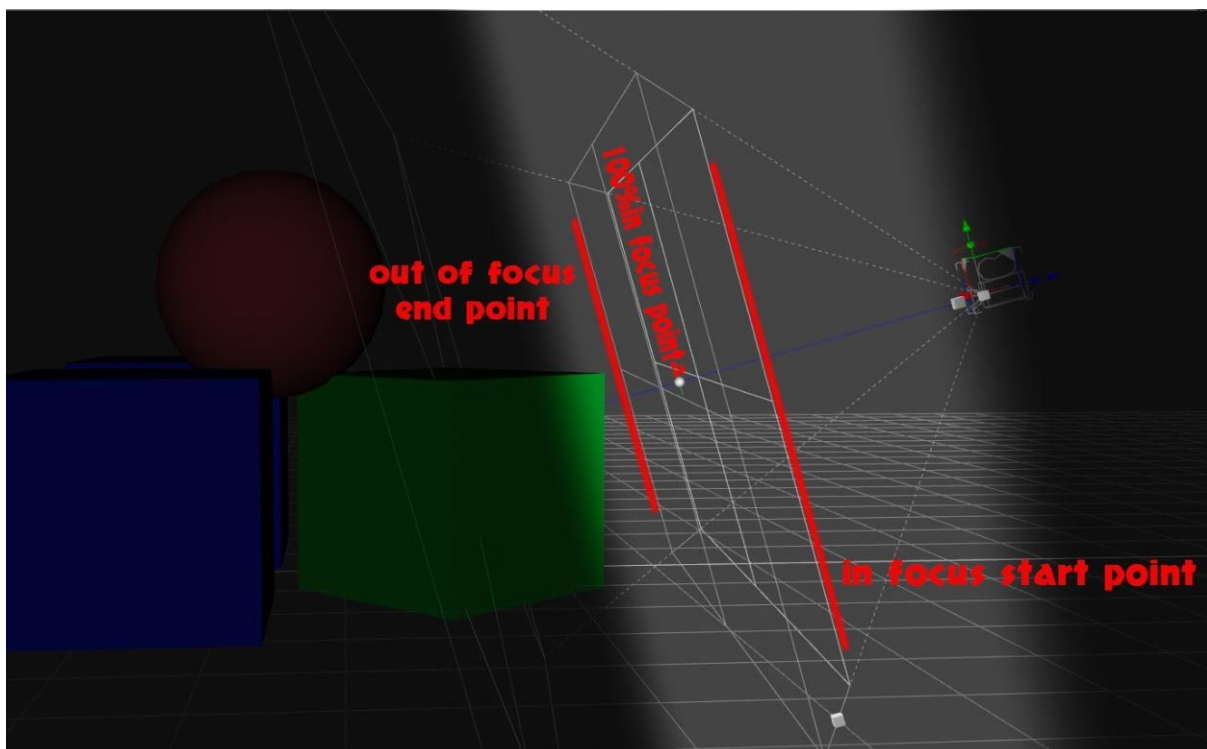


Make sure that the correct camera is selected in the top left of the pane (when you select the camera in the scene pane it should auto select the right camera)

When you move the slider for focal distance you should see in the viewport the area that's in focus and move back and forward with your movements.

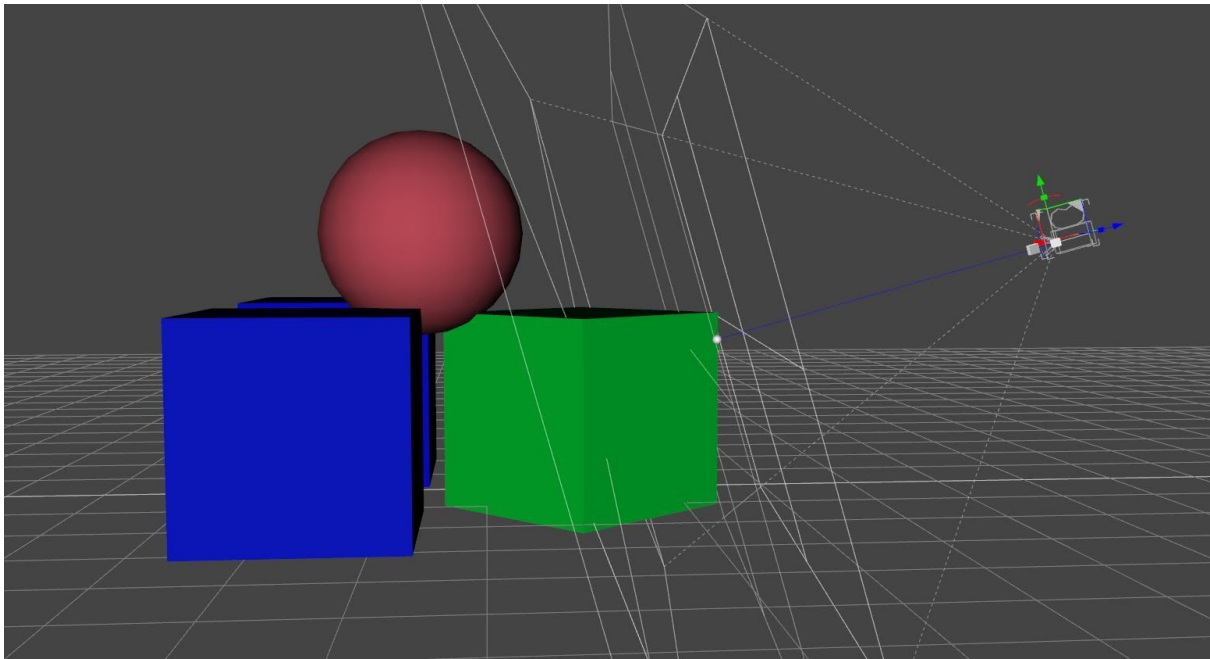
Use the slider to select the area you wish to be in focus.

The little sphere in the middle coming from the camera is the area that is in focus along with 2 boxes before and behind it to show you how much is in focus highlighted here.



So then move the slider so that it is where you want the focus to be.

In my case I want the focus to be on the closest corner of the green cube as below.

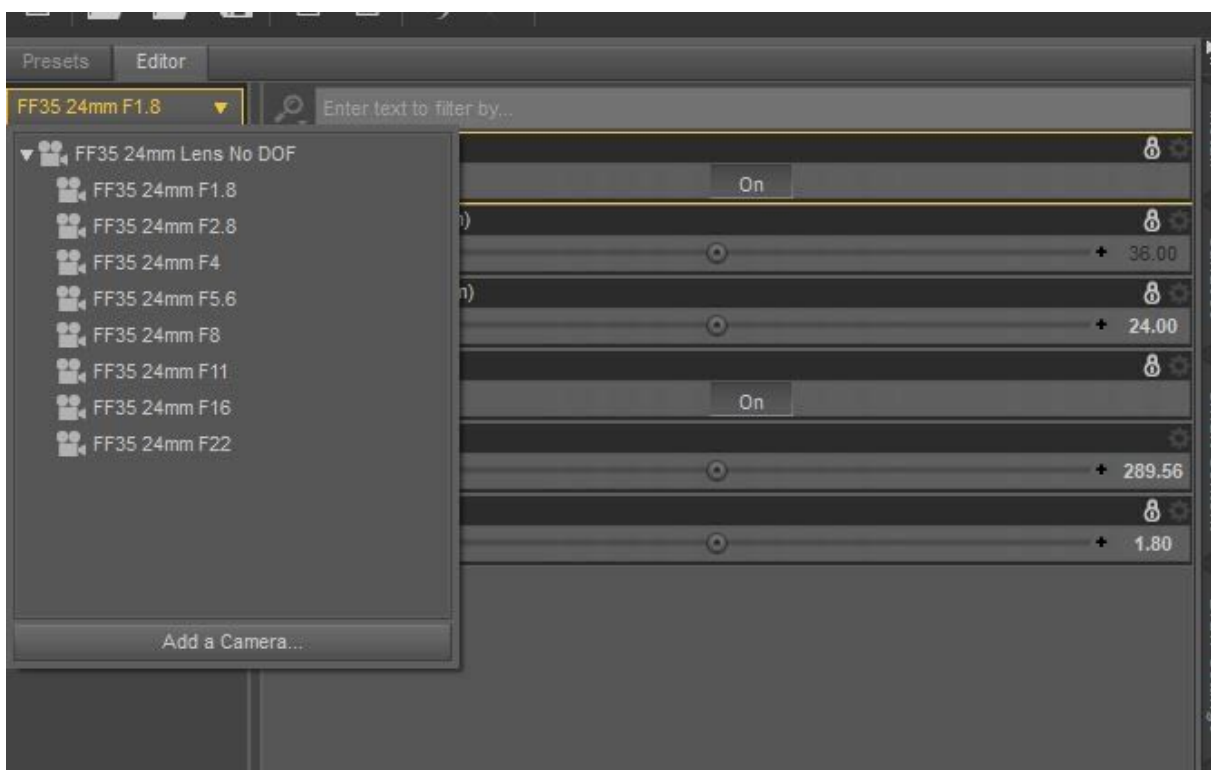


Next we need to apply that focus point to all the other F Stops on the lens

Either write down, remember or copy paste the number on the right hand side here.



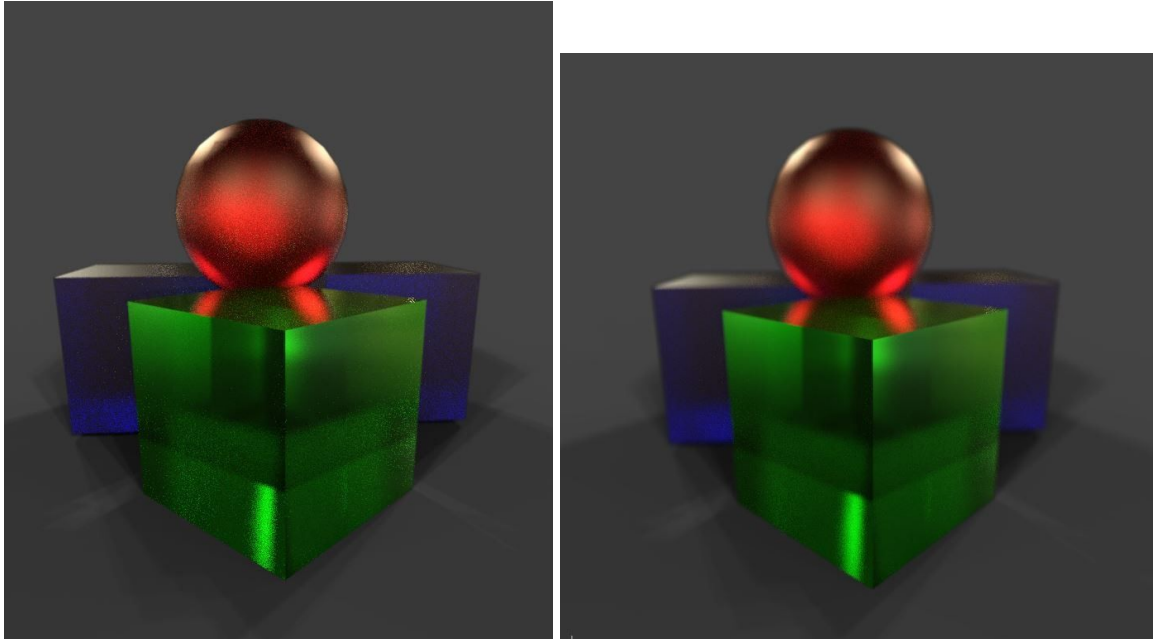
Once you have copied that number select the other cameras in the top left and paste that number in the same field.



Once you have pasted the number in each of the cameras you have focused the camera!
This is useful for say selecting the nearest eye of a living subject.

Now you can select the different F stops in the viewport and they will all be focused on the same spot

Below F5.6 and F1.8



Using the supercam

Functionality wise the super cam is exactly the same as the individual lenses but contains all of the individual lenses as well as all the F Stops for them.

The cameras are largely designed so you can rapidly switch through the focal lengths for a shot by selecting the No DOF options for each.

Most people will use individual lenses rather than all of the lenses.

Just remember that to move the cameras in the scene that the supercam has to be selected in the scene tab as all the other cameras are always locked to the parent in the tree.