



Blurring with Depth Maps

# Blurring with Depth Maps

In this lesson, we're going to take a look at depth maps. A depth map will allow you to control how blurry a background should look in your images. It is essentially a grayscale image that represents, or describes, the depth in the photograph. This will educate Photoshop as to what areas should look as if they were near the camera and what areas should look as if they were farther away from the camera. Then, it will blur the photograph based on this grayscale image.

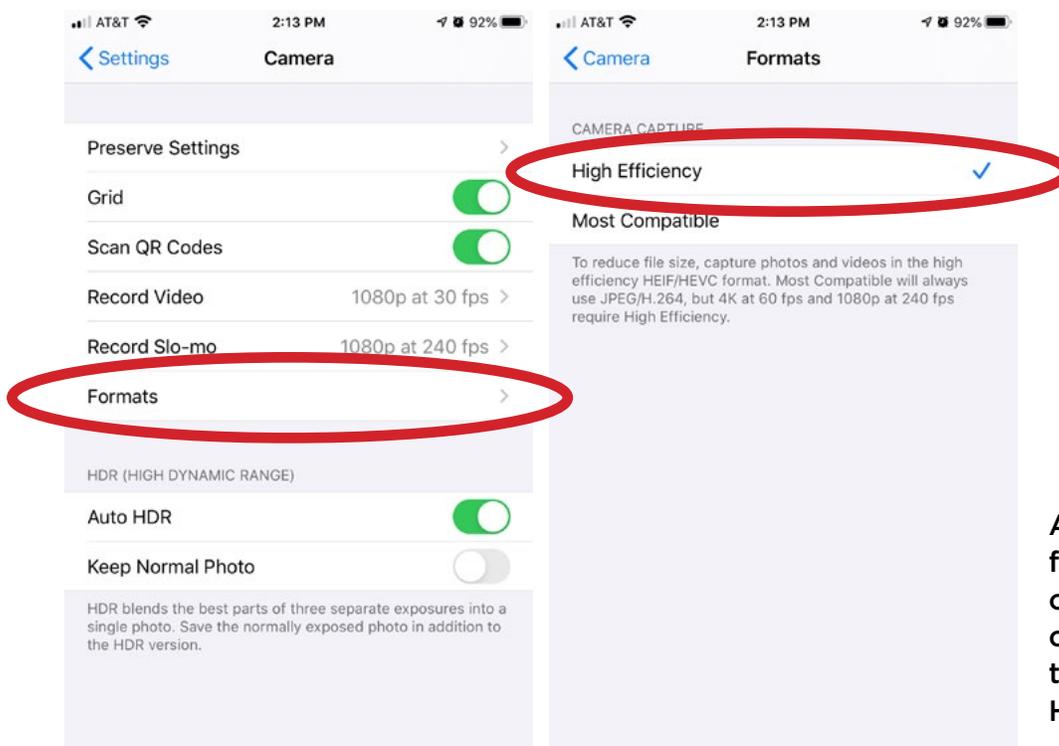
With this lesson, we're going to work with photos that already have these grayscale images attached to them. These were all created with an iPhone. On the iPhone, there is a feature in the Camera App called Portrait Mode. In this mode, you can tap on the screen to determine which areas should be in focus and it will attempt to make the background look soft. It will automatically create this grayscale depth map for us. In a future lesson, we'll take things a step further and learn how we can create our own depth maps for images shot on our regular, DSLR camera.



**LEFT:** This is an example of how a depth map was applied to an image to selectively determine what areas should be out of focus. **BELOW:** The image without the depth map.



**iPhone file format settings** In order to get these iPhone images so we can use them in Photoshop, we need to make sure that they're being captured in the correct format. On the iPhone, open the Settings App and scroll down to the Camera settings. Here, you will find a setting for formats. One option is called "Most Compatible" and this will save a JPEG image. The other option is called "High Efficiency" and this is the one you'll want to use. This will result in a HEIC file (for high efficiency) where the "C" stands for container, which means it can actually store more than one picture in one file.



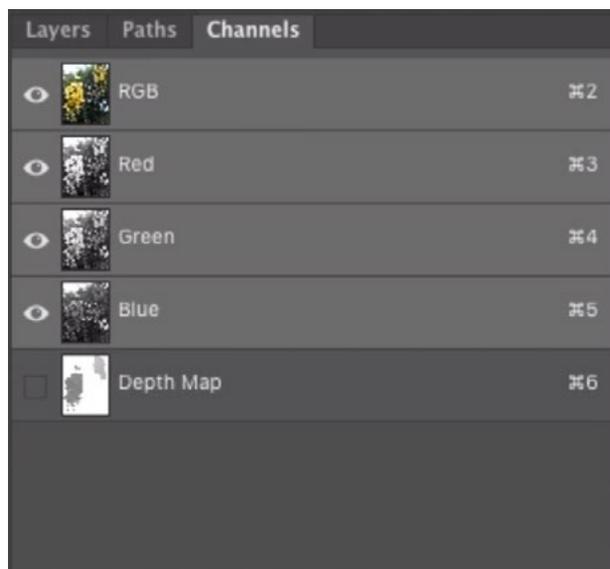
**Moving photos from iPhone to desktop** Next, we need to be careful of how we send the image from the iPhone to the desktop. With most default settings, it will attempt to convert the images to JPEGS and that's not what we want. We want to maintain that HEIC format. I find that when I AirDrop images from my phone to my computer, they remain in the HEIC format. If this does not work, or is not an option, you can instead use Bridge. Attach the phone to your computer via the USB cord, click on the File menu in Bridge and choose to "Import from Device."

## Intro to the Lens Blur Filter (Timestamp 6:07)

There are a few different blur filters available in Photoshop, but we're going to be using the Lens Blur feature in order to specify what areas should be sharp and blurry. The Lens Blur feature allows us to use an alpha channel, or a saved selection, to specify what areas should be completely blurry, what areas should be completely sharp and what should be in between. This alpha channel is the gray-scale image that will serve as the depth map.

To create a very simple alpha channel, we could create a basic selection and then save that selection by clicking on the Select menu and choosing Save Selection. Then, we could open the Channels Panel and that selection can be seen as an alpha channel, where the selected areas are white and the un-selected areas are black.

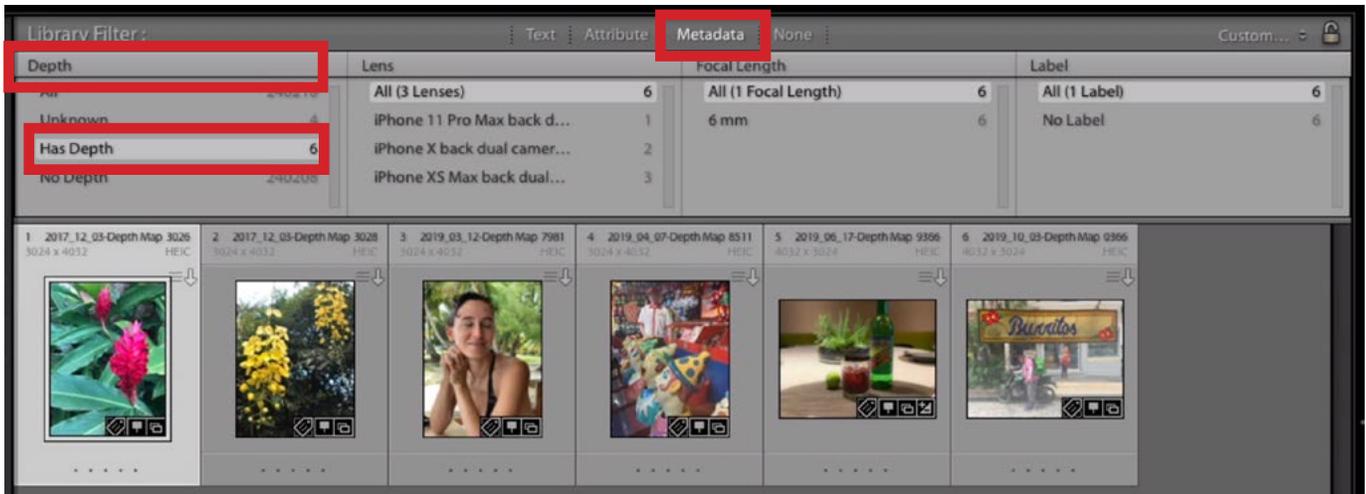
When we use that alpha channel, or depth map, in the Lens Blur window, we are defining the different planes of focus. The white areas will be thought of as having one plane of focus and the black areas will be thought of as having another. We can click within the image to determine what area should be sharp.



**The Depth Map will appear as a channel, which can be seen within the Channels Panel. The light parts of the channel represent the areas that Photoshop thinks are farther from the camera.**

In this lesson, we're working with iPhone images that already have this depth map built in. We just need to make sure that the images are being loaded into Photoshop in such a way that we can use them.

**Filter for HEIC images in Lightroom** In Lightroom, you can filter your images to see which were shot in the HEIC format that saves depth information. Expand Metadata category of the Filter Bar and click on one of the top search parameter menus. One of the items that you can populate the filter with is an option called “Depth.” Click on the “Has Depth” filter that will appear beneath the menu. This will show all of your HEIC images files that have depth information.

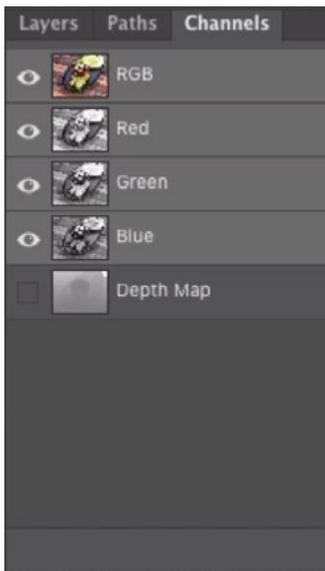


In Lightroom, the Filter Bar is being used to locate all images that have depth maps.

**Opening HEIC files in Photoshop** Note that you can't move an image from Lightroom to Photoshop using the standard method (Photo Menu > Edit in > Edit in Adobe Photoshop) when working with depth maps. If you move the image this way, the depth map channel will not be included. Instead, right-click on the image and choose to “Show in Finder.” This will show you the original file on your hard drive. Click and manually drag this file to the Photoshop icon. Then, you can open the Channels panel and you will see the Depth Map channel.

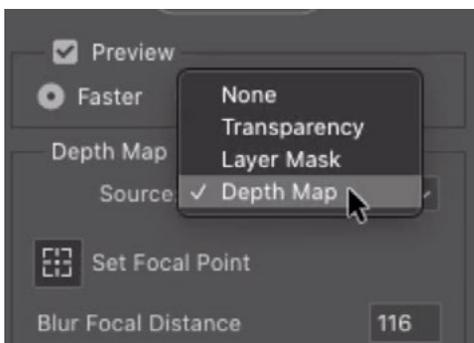
## Working with Depth Maps (12:55)

**View the Depth Map** Let's look at the depth map. With the Channels Panel open, click on the depth map channel to view it in the main image window. With a depth map, things that are far away will be light in tone. White represents the thing that is farthest from the camera. Things that are closer to the camera have darker and darker shades assigned to them. We can use these tones to selectively blur the picture. In the Channels panel, click back on the RGB channel to view the image normally.



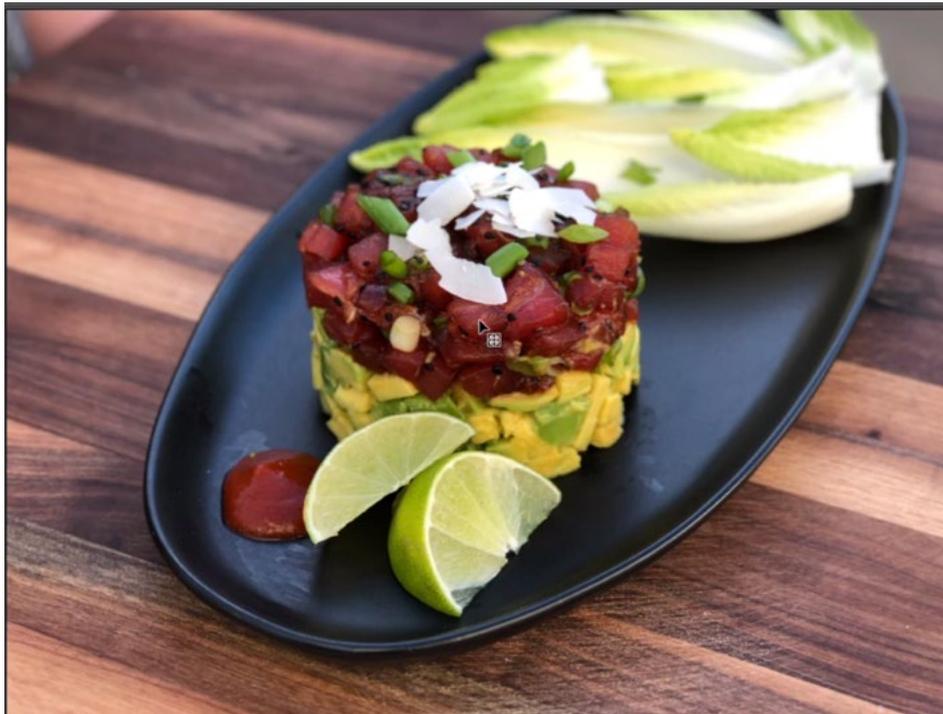
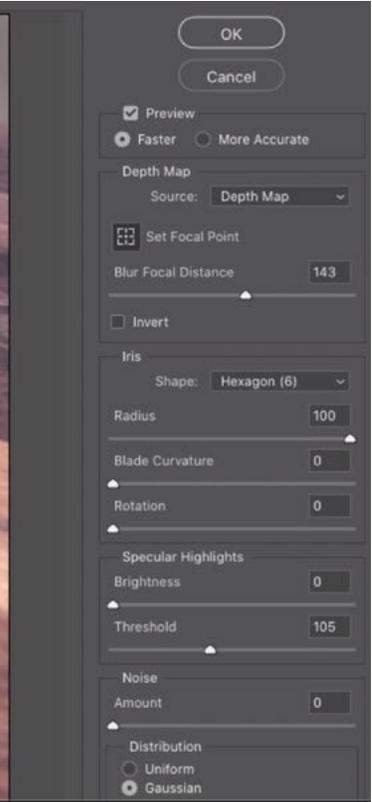
At left, you can see the image along with the Channels Panel containing the depth map.

**The Lens Blur Filter** We'll click on the Filter menu and choose Blur > Lens Blur. The Lens Blur window will take over the screen. In the settings panel on the right side of the screen, we need to click on the Depth Map Source menu and choose the



In the Lens Blur window, the Source menu is being set to the Depth Map channel.

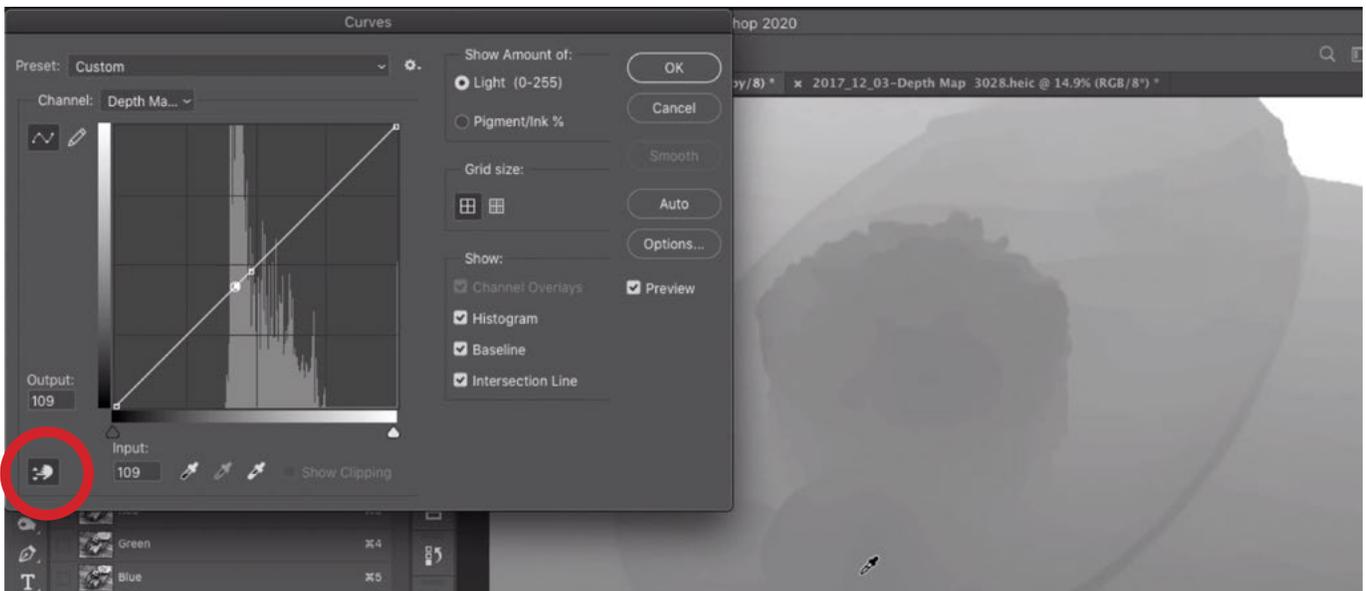
name of the Depth Map channel. If the image was shot on an iPhone, this channel will always be titled "Depth Map." With this source chosen, we can click within the picture to determine what area should be the sharpest. When we click, it looks at the depth map, determines what shade of gray is under the mouse and it assigns that shade as what should be sharpest. The Radius slider determines how blurry the other areas will become.



**ABOVE:** In the Lens Blur filter, we selected the Depth Map channel as the source and we clicked on the background. You can see that the background is in focus but the foreground is not. **LEFT:** Here, we clicked on the foreground instead. The filter used the Depth Map to make the foreground in focus.

**Adjust the Depth Map using Curves** Notice that there is no setting that allows you to determine how deep the depth of field is. This makes it hard to make two planes of focus become sharp at the same time. It is possible, however, if we make changes to the grayscale depth map. To do this, we'll need to exit the Lens Blur window. We'll open the Channels Panel and we'll click on the Depth Map channel in order to view it in the main image window. Here, we can take the two or more areas that we want to be in perfect focus and make sure that they are the same shade of gray. You could use the Brush Tool to paint in the same shade of gray to these areas, but in the video example, we're going to use a Curves adjustment. We'll click on the Image menu and choose Adjustments > Curves.

The Curves dialog will appear and we'll make sure that the Targeted Adjustment Tool is active. (It looks like a little hand icon.) Using this tool, we can click within the image in order to target just the shade, or brightness level, that we click on. We want the back part of the food to be the same tone as the front part of the food so that both areas are equally in focus. We'll click somewhere within the back part of the food and a point will be placed on the curve. Then we'll click somewhere within the front part of the food to place a second point on the curve.

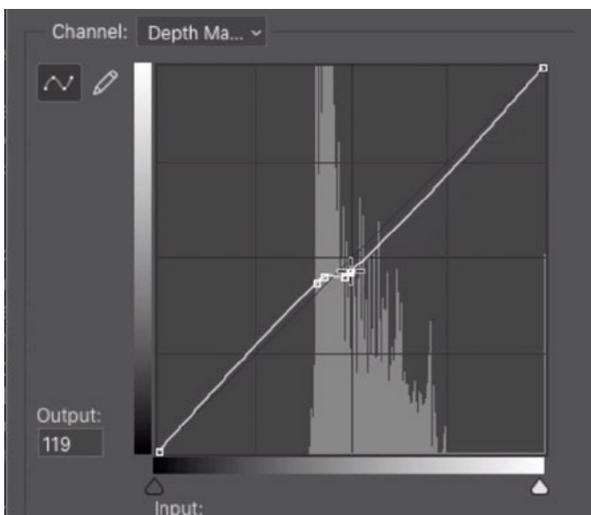


**The Targeted Adjustment Tool (circled) was used to place two points on the curve. These represent two areas that we want to be equally in focus.**

We want these two curve points to be at the same level on the curve. This will ensure that they are the same brightness, and will therefore be in the same focus range when we use the Lens Blur filter. We'll click on the lower of the two dots to make it active and we'll use the up arrow key to nudge it upward. Then we'll click on the upper dot and we'll use the down arrow key to nudge it downward. We just want the two dots to be even. As we do this, the two targeted areas will become the same shade of gray in the Depth Map.



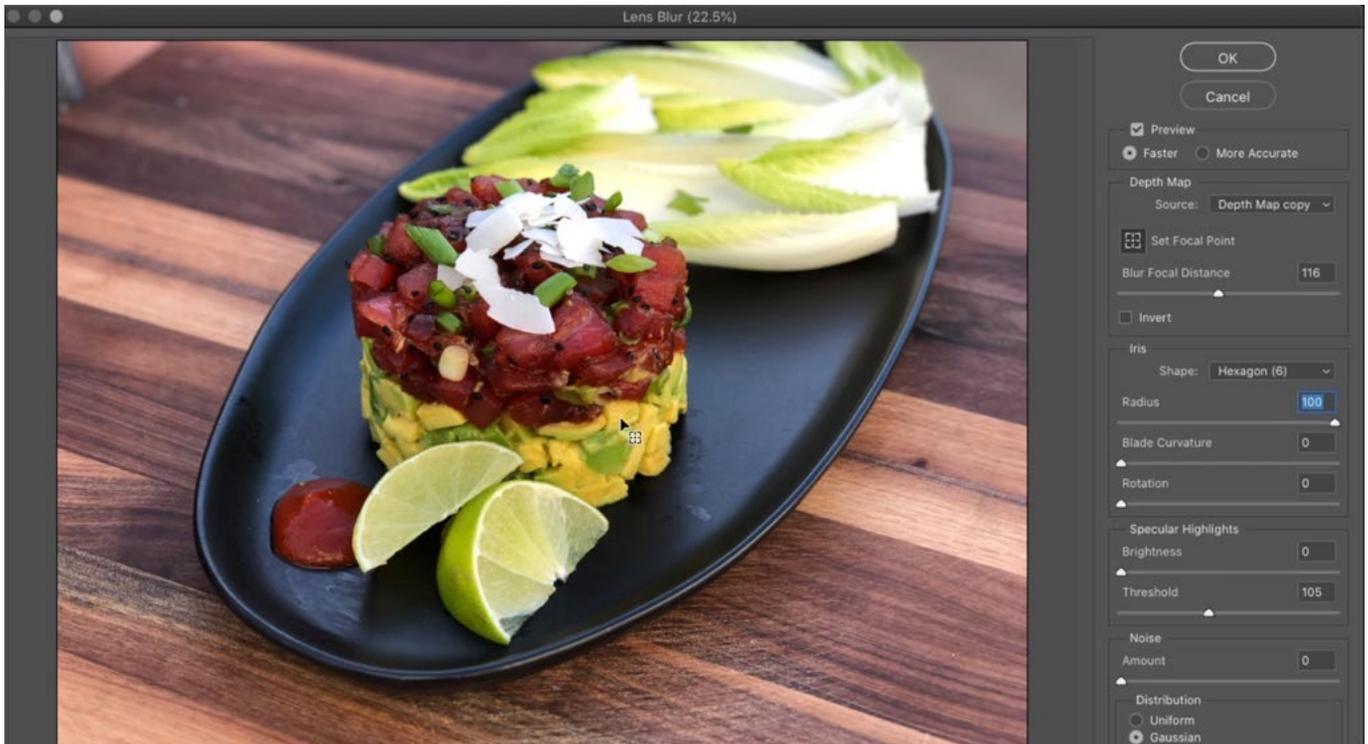
**The two curve points were nudged so that they became perfectly even.**



**Two additional points were placed on the curve and positioned so that the rest of the curve became close to diagonal.**

The entire curve became distorted when we moved the two dots, so we'll want to straighten out the curve so that it doesn't brighten or darken the rest of the image quite as much. We'll click to add two more points on the curve and drag them close to the two existing points, positioning them so the curve line looks to be as close to a diagonal line as is practical. We'll click OK to exit the Curves dialog.

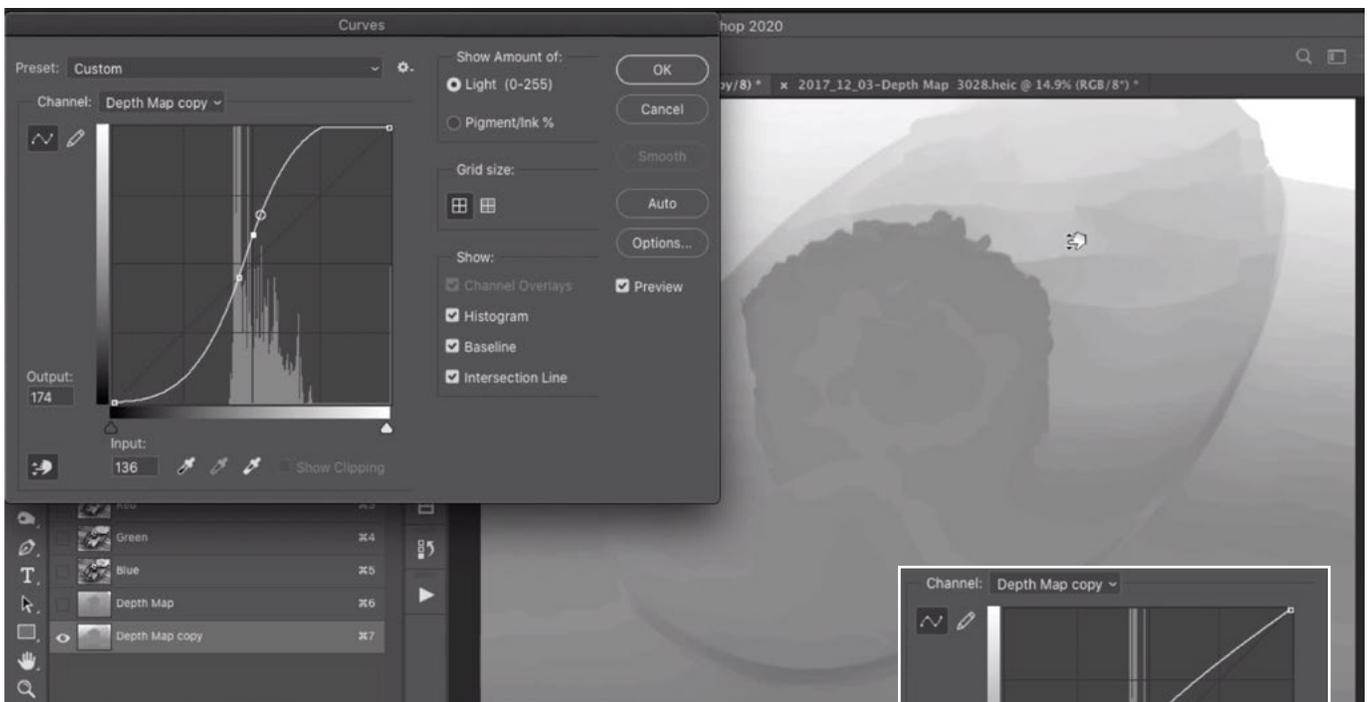
We'll click on the top-most channel (RGB) to return to viewing the main image and we'll try to run the filter again. We'll click on the Filter menu and choose Blur > Lens Blur. In the Lens Blur window, we'll make sure that the Source menu is set to the appropriate Depth Map channel and then we'll click somewhere on the subject (the food) to make it in focus. Because the entire food area is the same shade of gray, it should remain in focus. We can move the Radius slider to try and adjust how blurry the rest of the image becomes.



**After using Curves to adjust the two areas we wanted to be in focus, we used the Lens Blur filter to click on one of those areas. Because the two areas are the same tone in the Depth Map, they are both now in focus.**

In the example image, the food became nice and sharp, but we can't seem to get the rest of the image to be as blurry as we'd like. We moved the Radius slider up as high as it would go, but the background still isn't blurry enough. There are two things we could do about this. First, we could click OK to exit the filter and simply run the Lens Blur filter a second time. The other option would be to further adjust the Depth Map channel. That's what we'll do.

We'll exit the Lens Blur Filter and we'll click on the Depth Map channel to view it in the image window again. If we want the background area to be much blurrier than the food, we'll need Photoshop to think that the area is farther away from the camera. We can do that by making the area brighter. We'll click on the Image menu and choose Adjustments > Curves. The Curves dialog will appear and we'll again make sure that the Targeted Adjustment Tool (the hand icon) is active. Using this tool, we'll first click on the food area in order to place a point on the curve, locking in the brightness of that area. Then, we'll click in the area that we want to be blurry and we'll drag upward. This will place a second point on the curve and move it up, lightening that targeted tonal range. This distorted the curve line quite a bit, so we'll place two more points on the curve and position them so that the rest of the curve line is close to diagonal again. We'll click OK to exit the Curves dialog.



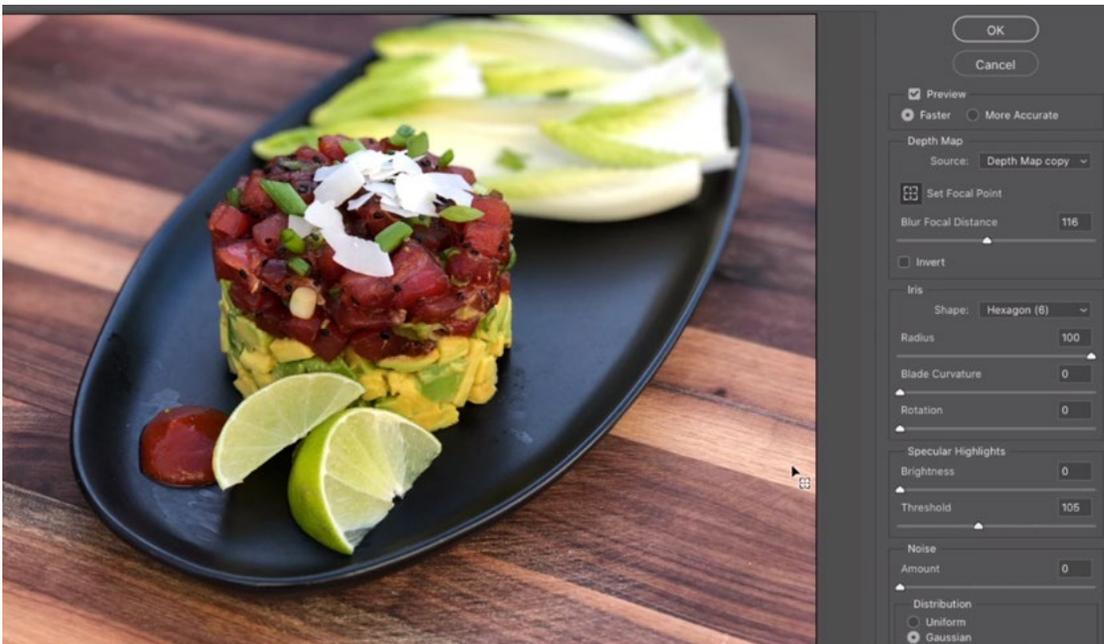
**ABOVE:** A Curves adjustment is being made to brighten the tone in the background. This will make Photoshop think that this area was farther from the camera.  
**RIGHT:** Additional points are being placed on the curve and positioned so that the rest of the curve becomes close to diagonal again.



**Adjust the Depth Map using the Brush** We could also make changes to the Depth Map channel using the Brush Tool. We could paint with various shades of gray in order to make different parts of the image more in focus (or more out of focus). With the Brush Tool active, you can sample a color from within the image by holding down the Option key (Alt on Win) to temporarily access the eyedropper tool. Click within the image to sample a color. That color will become the foreground color, which is the color you'll paint with using the Brush Tool. If we want two areas to be equally sharp, we could sample the color from one area and use the brush to paint over the other area with the same color.



**ABOVE:** We sampled a color from one area of the depth map and are painting the same tone into another area. We want both of these areas to be equally sharp.



**BELOW:** In the Lens Blur Filter, we clicked on one of the areas to make it sharp. Because we adjusted the depth map, both areas became equally sharp.

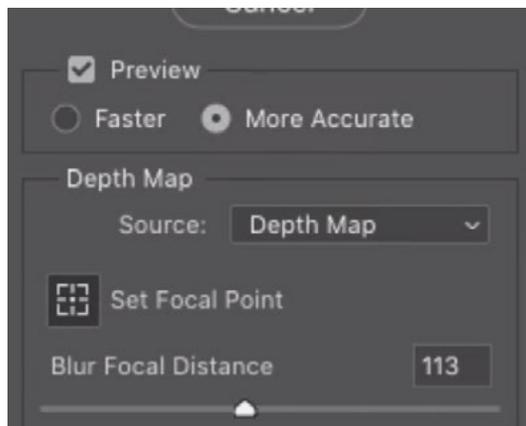
## Artifacts around the Edges of Objects (27:20)

There may be instances where you run the Lens Blur filter using the Depth Map channel and end up with an undesirable artifact around the edges of objects. In the video example, we have an image of some yellow flowers. When looking at the image before using the filter, the edges look fine. We also can not see any artifact when looking directly at the depth map. When we run the filter, however, we end up with an ugly halo around parts of the flowers. That's because the filter is trying to work quickly so that the sliders respond very quickly. In order to do that, it uses a lower resolution version of the channel so it doesn't have the full fidelity of the original.

If you don't mind the filter rendering changes a little slower, turn on the "More Accurate" setting that's located at the top of the adjustment panel on the right side of the Lens Blur window. This will cause the preview to look high quality and the artifact will disappear.



Here you can see a halo artifact around the edges of the flowers.



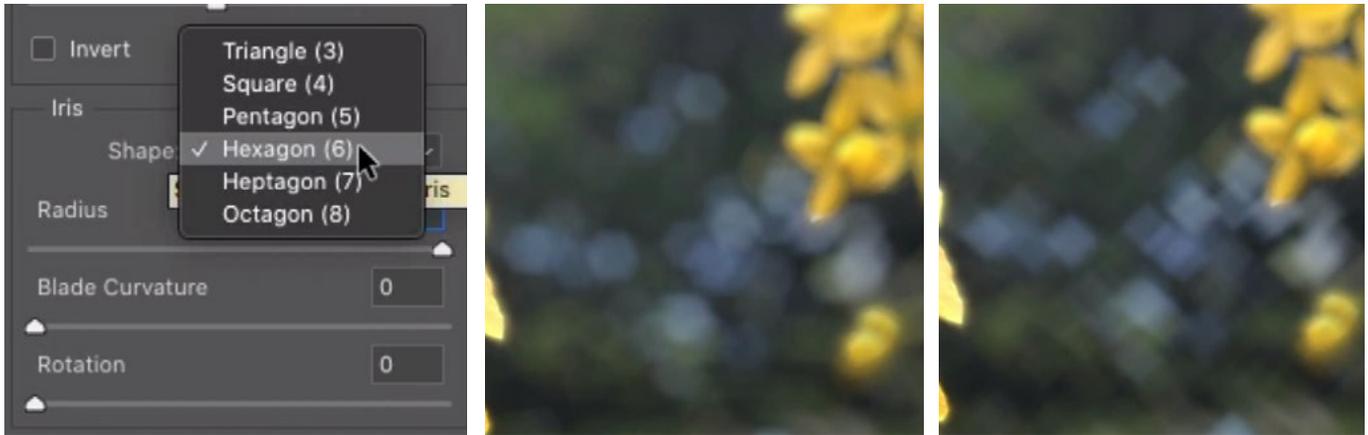
The Preview option is being set to "More Accurate."



You can see that the halo artifact went away.

## Controlling the Background Highlights (29:18)

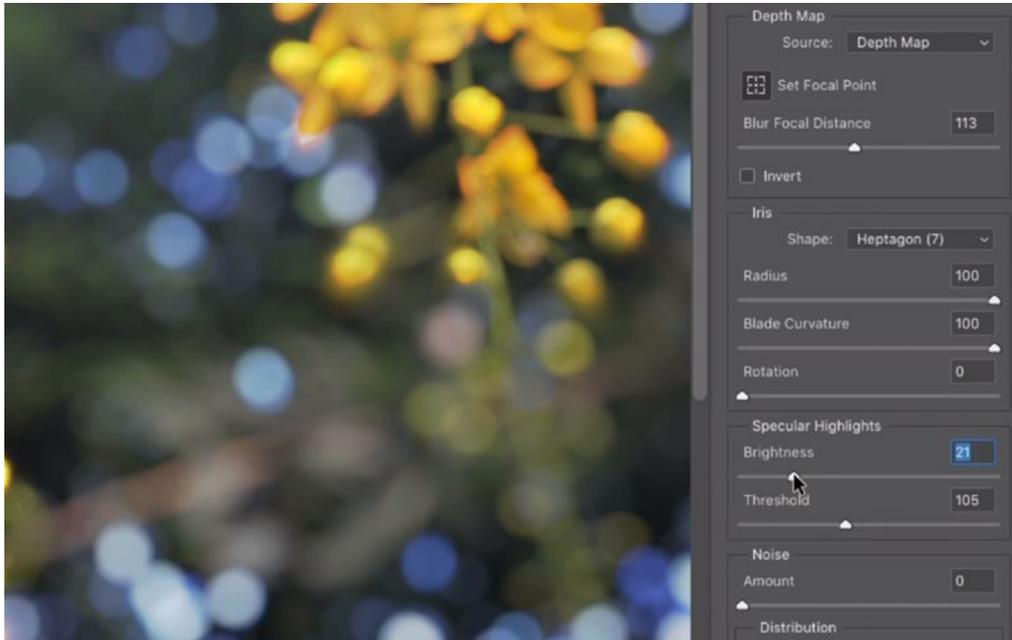
When you blur areas in the background, you will notice that the highlights become bigger. The blurrier the background becomes, the larger the highlights will be. These highlights will also have a certain shape, and you can determine what shape they will be within the settings panel.



**The Shape menu can be used to change the shape of the highlights. In the center screen shot, the shape was set to Hexagon. In the right screen shot, the shape was set to Square.**

In the settings panel, there is a category called Iris. Here, there is a Shape menu that can be used to determine the shape of the highlights. The Rotation slider will rotate the shapes. The Blade Curvature slider can then be used to determine how soft the corners of the shape will be. If you move this slider all the way up, the highlights will become perfectly round.

The Specular Highlights settings also give you more control over the out-of focus areas. Use the Brightness slider to brighten those areas, making them more prominent. The Threshold slider determines which of those bright shades are considered highlights and therefore how many of those shades should be brightened when you use the Brightness slider.



At left, the Blade Curvature slider was moved all the way up. This caused the highlights to become circular. The Brightness slider is also being moved up, which is causing those highlights to become brighter.

The Noise slider can be used to add grain to the part of the image that is being blurred. This can be useful for making the amount of noise in the blurry areas match the amount of noise in the sharp areas.

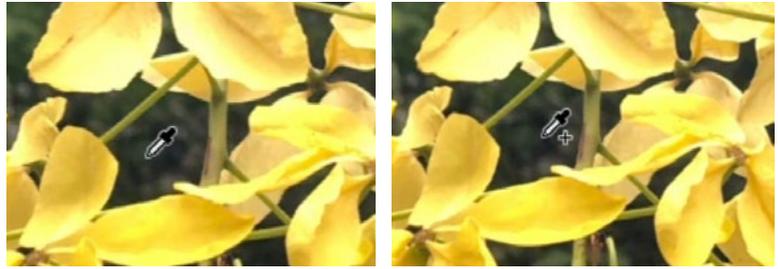
## Fixing Gaps in the Depth Map (33:24)

The depth map created by the iPhone can sometimes be quite faulty. If the subject has gaps in it, then it sometimes can't tell that the area within those gaps is supposed to be part of the background. In the example image with the yellow flowers, you can see that part of the greenery between the flowers is sharp, whereas the greenery surrounding the flowers is blurry. It should all be blurry. Looking at the depth map channel, we can see that the image is gray where it should be white. We'll need to adjust the mask to correct for this.



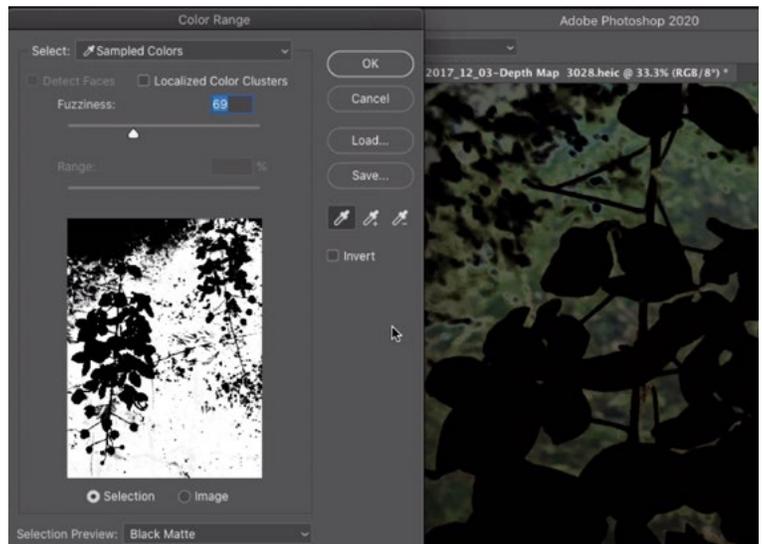
**The greenery viewable between the flower petals is not blurred as it should be.**

Because the area that's supposed to be blurry is all green, we can start by making a selection using the Color Range command. With the RGB channel active, we'll click on the Select menu and choose Color Range. The Color Range dialog will appear and we'll start with the Fuzziness slider all the way down (at zero). Then we'll use the eyedropper to click within the color we want to select. This is the greenery between the yellow flowers. A small preview of what's selected will appear in the Color Range dialog. We'll activate the little plus eyedropper (+) and click on additional shades of green, expanding that selection. Because the small preview can make it hard to tell what's selected, we'll experiment with the Selection Preview menu at the bottom of the Color Range dialog. This will overlay the selection in the main image window. If we choose the Quick Mask option, then all non-selected areas will get a red overlay. If we choose the Black Matte option, then all the non-selected areas will get a black overlay. We can continue to use the eyedropper to add to the selection while viewing the selection this way.



**The Select Color Range command is being used to target green colors from the background.**

Once we're getting happy with the selection of the green areas, we can use the Fuzziness slider to expand the range of colors being selected. We'll bring this slider up quite high and then we'll back it down until only the green background is selected. We'll click OK to exit the Color Range dialog and we'll be left with a selection of the green areas. We'll use this selection to fix the depth map.



**The Select Color Range command was used to select the green color in the background.**

With the selection still active, we'll click on the Depth Map channel to make it active and visible in the image window. We'll make sure the foreground color is set to White and we'll activate the Brush Tool. We'll use a large brush to paint with white over the part of the image that needs to be blurred. The selection will limit the paint strokes to the background area.

Now, we can apply the Lens Blur filter again and the background will be blurred between the flowers as well.



**LEFT:** We are painting with white on the Depth Map channel and the selection is limiting the paint strokes to the background area. **RIGHT:** The Lens Blur filter was used and now the area between the petals is also blurry.

**View image and depth map at the same time** There may be times when you'll need to be able to see the actual image while making changes to the depth map in the Channels Panel. You can do this by viewing the main depth map as an overlay on top of the picture. With the Depth Map channel active and viewable in the main image window, turn on the eyeball icon next to the RGB channel. (Don't click on the name of the channel, as this would actually activate that channel. You just want it to be visible.) Now the depth map will appear as a red overlay on the picture and you can use the Brush Tool to refine the mask.