

Photoshop® DIMENSIONS



Photoshop Dimensions

An Overview of 3D in Adobe® Photoshop® CS 6 Extended®

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Introducing Photoshop Dimensions

Welcome to the inaugural issue of *Photoshop Dimensions*, the magazine of 3D in Adobe Photoshop. Whether you are new to 3D in Photoshop or an old hand, *Photoshop Dimensions* will show you new and exciting ways to add another dimension to your work. *Photoshop Dimensions* is written by leading authorities and experts who truly understand Photoshop's powerful 3D features.

With the launch of Photoshop CS 6 Extended, Adobe has made vast improvements to the 3D user experience, including faster render times, a simpler non-modal working environments, on-canvas controls, intuitive interaction models and a better 3D workspace. If you have used Photoshop's 3D features in the past, you will find many exciting changes and additions that make 3D in Photoshop even more compelling. If you are new to 3D, we will show you how to make your images pop off the screen or the page.

In this issue of *Photoshop Dimensions* we look at the many changes made to Photoshop's 3D tools in CS 6 that will speed-up your workflow and expand your capabilities. In future issues of *Photoshop Dimensions* we will show you how to use the 3D tools and features, create models and meshes, design materials, light a scene and explore advanced rendering techniques. Photoshop is an important tool for kinds of visual creators: photographers, illustrators, graphic designers, user interface designers, video game developers and videographers and 3D has important applications for all of them.

We are very excited to be bringing you the best information on 3D in Photoshop and we hope you find *Photoshop Dimensions* fun and useful.

New Dimensions of Fun for All

Photoshop CS 6 Extended makes 3D approachable and easy to use for novices wanting to experiment in 3D as well as seasoned 3D artists. The powerful 3D tools in Photoshop can easily fit into many workflows.

Photographers

Photographers can use Photoshop's 3D features to add an extra level of realism to their works or to add additional elements that were not in the original photograph. This also allows all of your previous images to be reused in a new and exciting way.

Print and Graphic Designers

For graphic designers, Photoshop has been and will continue to be their “go to” app. Currently there is a trend of more 3D artwork being used in print and advertising material—from 3D text floating in space or sitting on a counter or shelf, to compositing various 3D elements such as cars or a clients package and artwork into a photograph.

Web Designers

The web is an ever-changing landscape of graphics and information. As a web designer, you are constantly looking at trends in design and offering solutions to your clients. Now you can easily create 3D assets for your website such as banners and buttons complete with transparent shadows and materials.

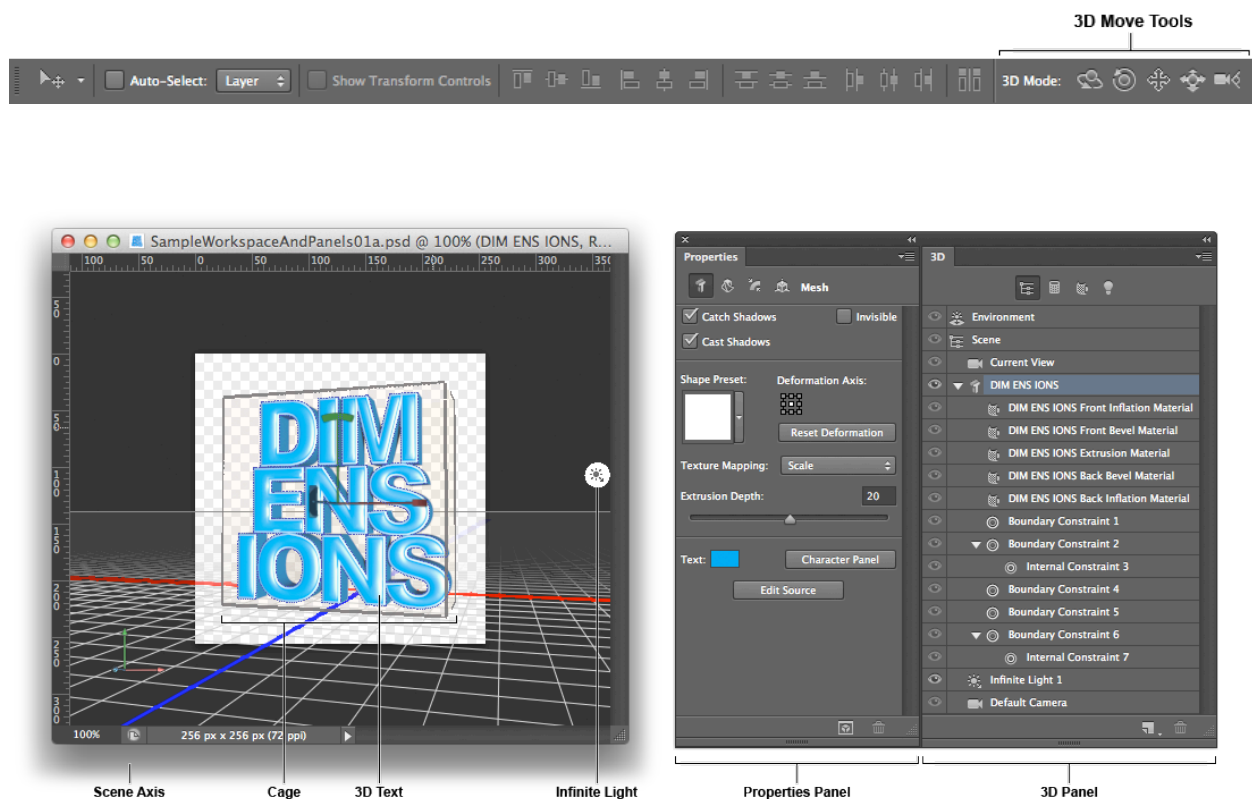
Motion Graphics

Combining Photoshop's 3D tools with the Timeline provides motion graphic editors a quick way to comp up wireframes or assemble and produce various motion elements such as lower thirds with 3D text.

The New UI

There are many improvements in the overall interaction design and experience for 3D in Photoshop CS6. Some features include:

- Updated look and feel
- Easily create new 3D content from layers, shapes, and text using menus and commands
- Simplified 3D tools: 3D Move, 3D Eyedropper and Material Drop tools
- Intuitive on-canvas interaction with 3D objects and views, cages, and more
- Separate Scene and Properties panels
- Scene Axis for view navigation no matter what is selected



Tool Option Bar (Move Tool active) with new 3D Mode tools (top), on-canvas UI elements (left), Properties and 3D panels (right)

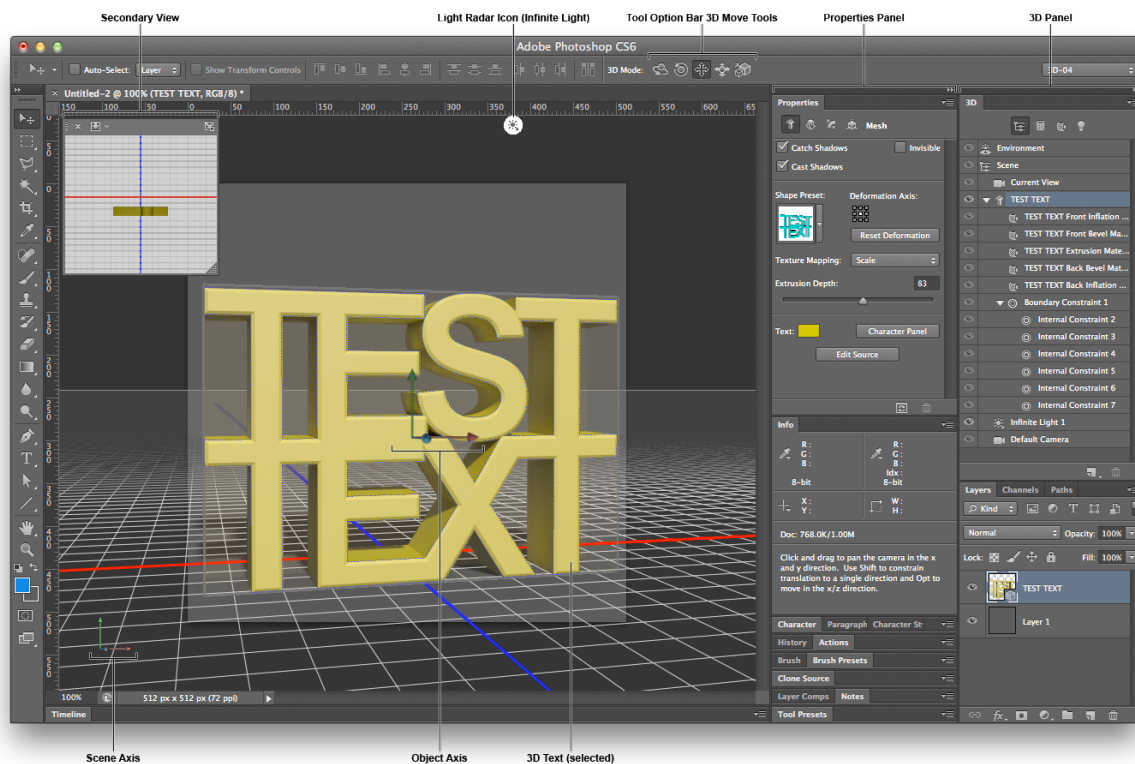
Welcome to the New User Experience

Interaction with 3D objects, the scene and properties has been greatly simplified in Photoshop CS6 Extended, making it much easier to get around—and saving time in your workflow. While easier to use, the 3D Engine has also become increasingly capable, providing both better effects and faster rendering times.

To make all this intuitive, Adobe introduced new UI elements on-canvas (such as the cage and axis widgets) as well as improved panels and menus, making it easier to understand without a lot of study.

A Room with a View

To better navigate working with 3D in Photoshop, there are five distinct areas you will be working with: menus, the toolbar, the tool options bar, panels (Layers, 3D, and Properties) and the on-screen UI (cage, axis widgets, and other HUD elements).



Some of Photoshop's 3D UI Elements

Integrated Tools

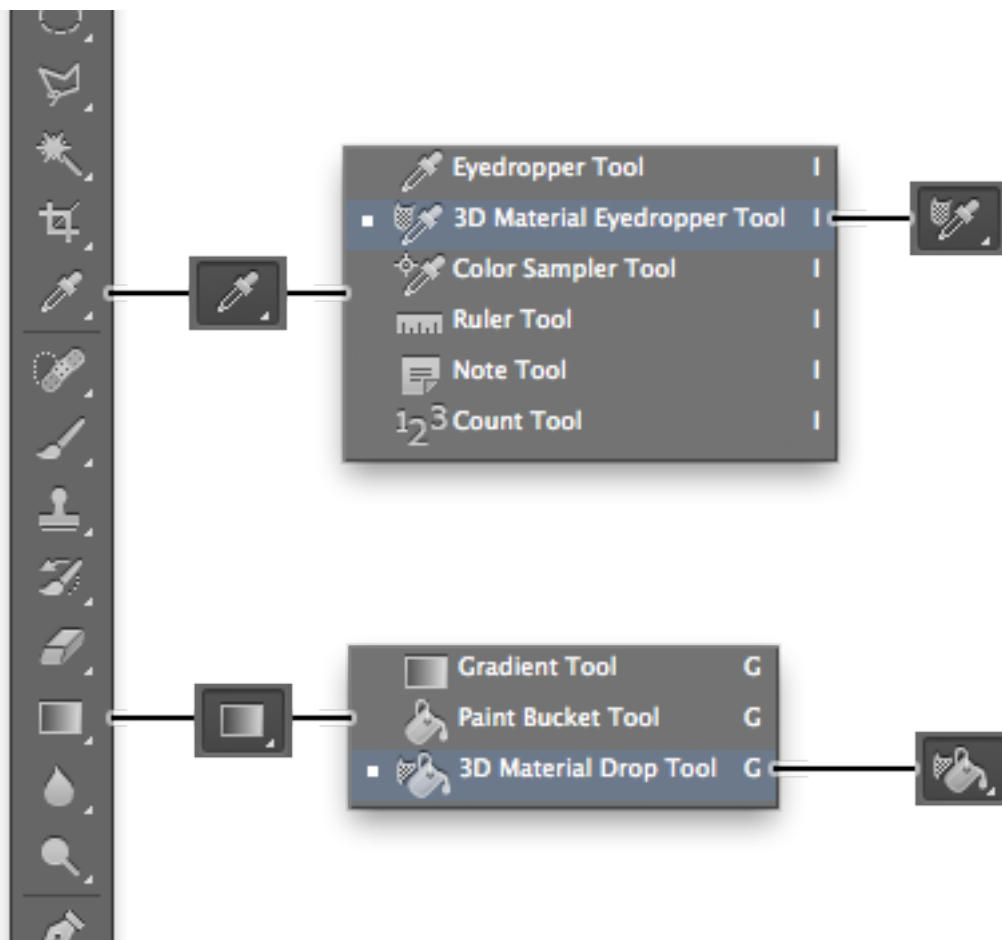
There are now only five 3D Move tools, two camera tools, the 3D Material Drop Tool (the 3D equivalent of the Paint Bucket Tool) and the 3D Eyedropper Tool. This is greatly simplified from CS5, which had more than 25 separate tools.



The Move tool's 3D mode become active when 3D Layer is selected



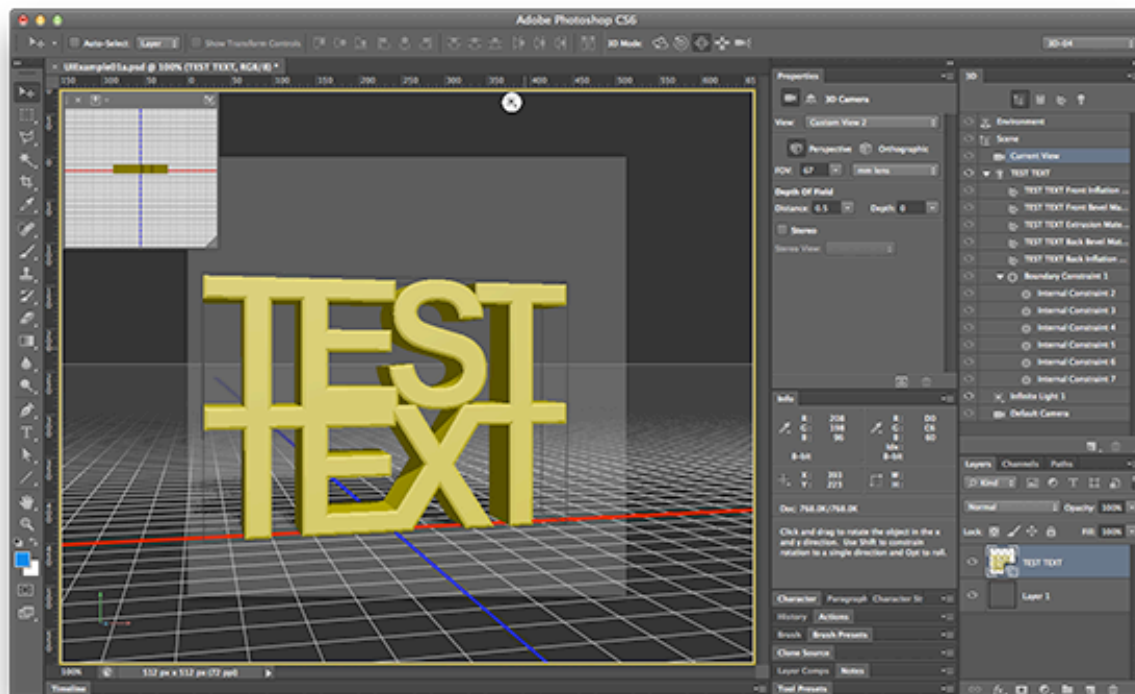
The 3D Mode tools (left to right); Rotate, Roll, Drag, Slide, and Scale



In the toolbar, the 3D Material Eyedropper Tool is now in with the Eyedropper Tool (top) and the 3D Material Drop Tool is in with the Gradient Tool (bottom)

Cage and Interaction

The cage is a new on-canvas control that allows users to easily and intuitively work with 3D objects. When selecting an object either on screen or in the 3D panel, the cage control presents itself along with the object axis widget. The cage provides a user with a large interaction target, making it easy for a user to move, slide, and rotate a selected 3D object in the scene.

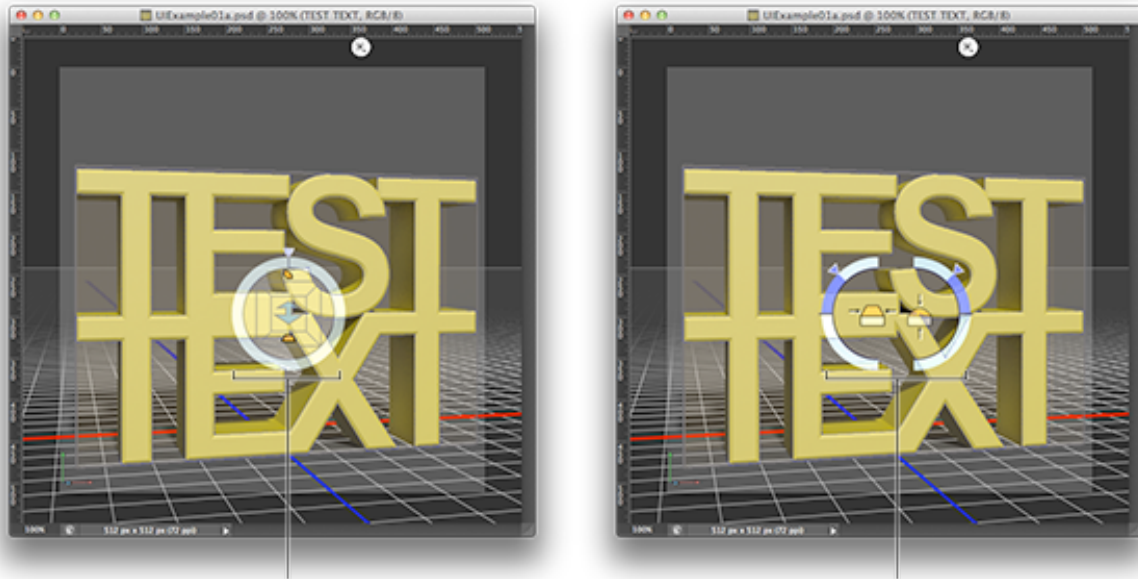


Current View selected in 3D panel, cursor hovering over 3D text (outlined)

The cage allow users to move an object along an axis or within a plane.

HUD

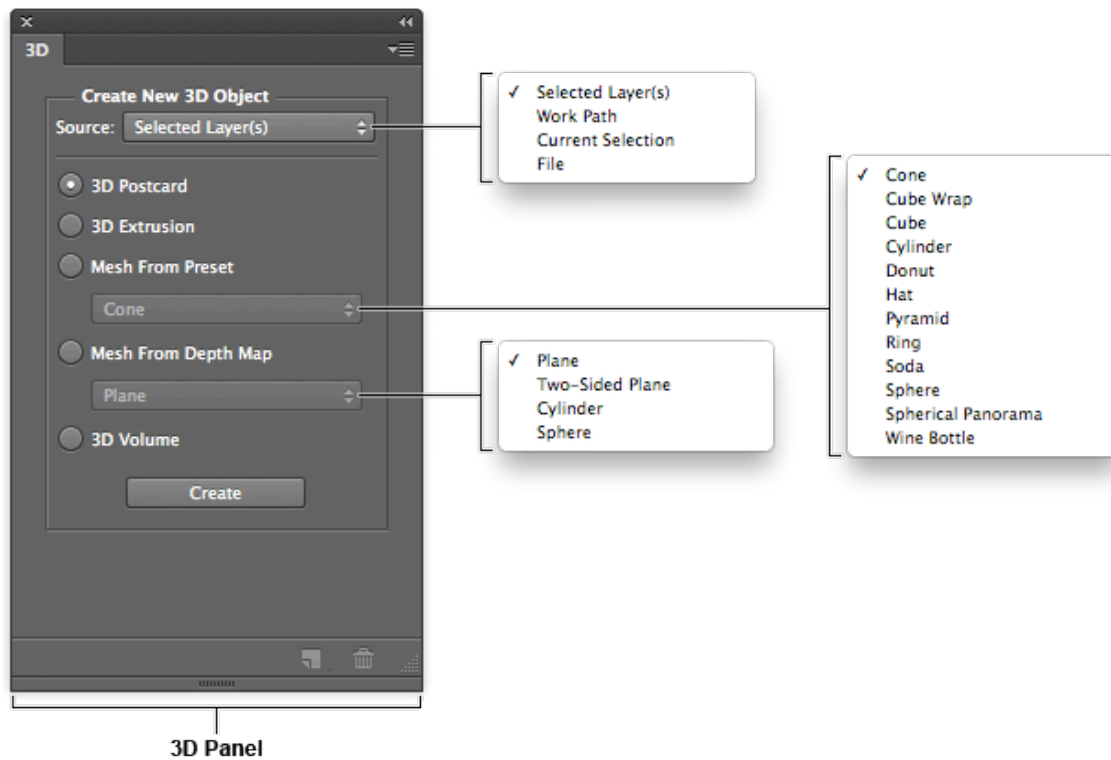
New to Adobe Photoshop CS 6 Extended are the various heads-up displays (HUDs) used interaction with object properties and providing real-time feedback. Below is an example of the 3D extrude HUD elements for deform and cap.



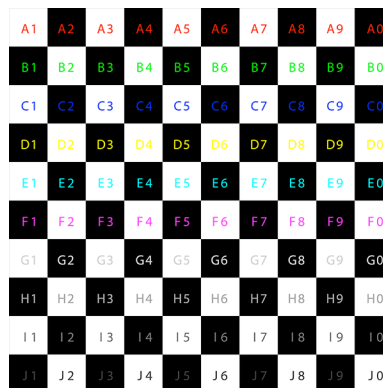
3D Extrusion HUD overlays; Deform HUD controls Taper, Twist, Extrude, Bevel, Bend and Shear (left), Cap HUD controls Bevel and Inflation (right)

Getting Started with 3D in Photoshop

Getting started with 3D in Photoshop CS 6 is easier than ever with the integration of 3D creation into various tools and contextual menus. In addition, when an image or vector layer is selected in the Layers panel, the 3D panel allows you to quickly create new 3D objects with the click of a button.



When a layer is selected you can create 3D objects using the 3D panel (above)

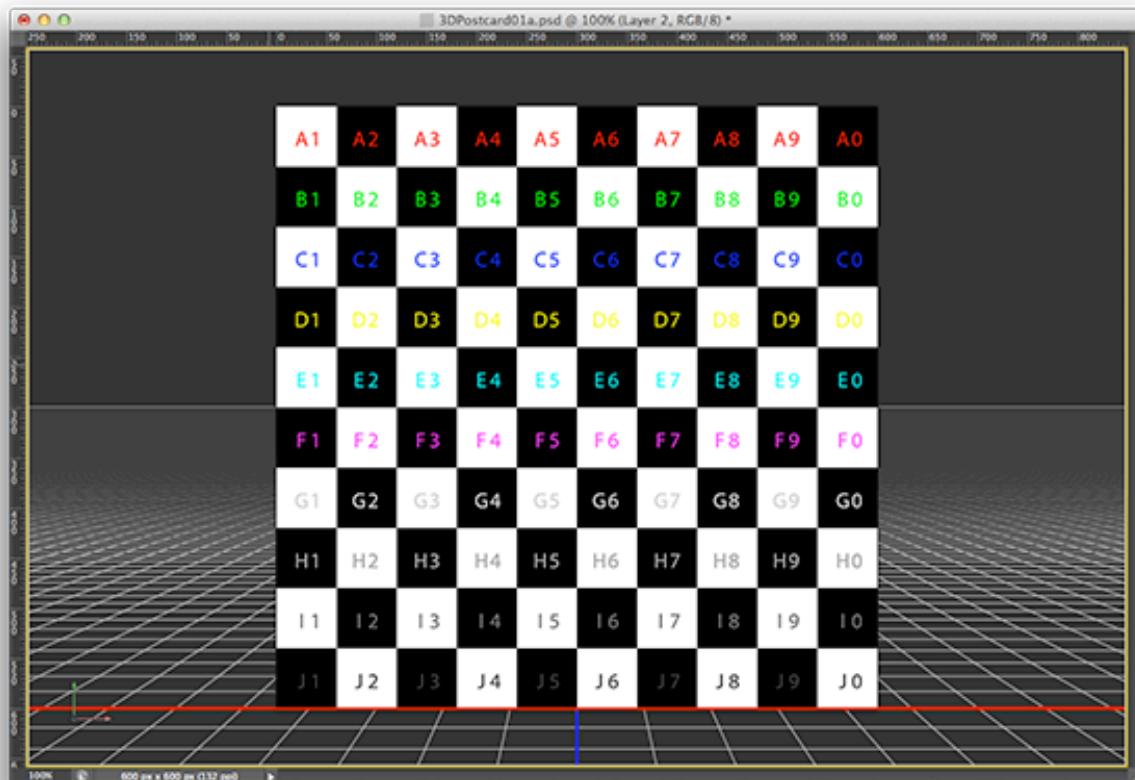


We will use the above test image for some of the samples to follow

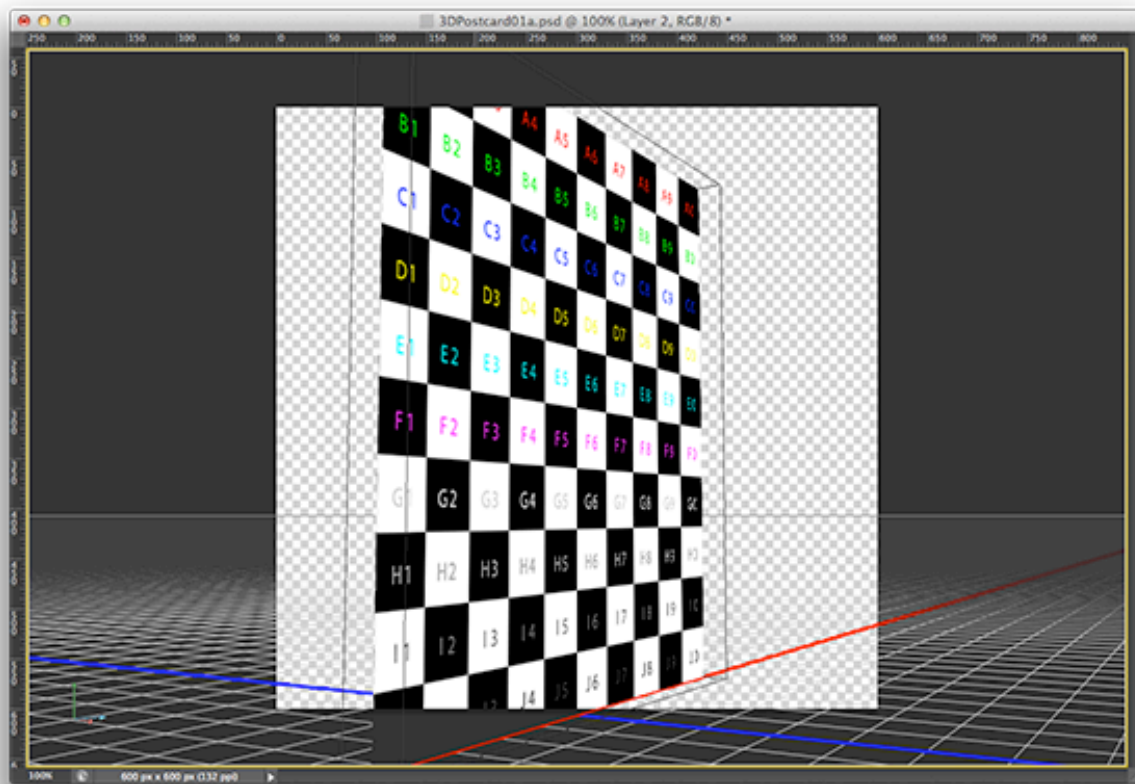
Making a Postcard

One of the easiest 3D objects you can create is a 3D Postcard. It takes the selected layer and then applies the layer as a material to a flat rectangle. Unlike the 3D Extrusions objects (3D Text and 3D Shapes) a 3D Postcard does not have additional attributes, such as Deform and Cap properties.

To make a 3D Postcard simply select the layer in the Layers panel, then in the 3D panel select 3D Postcard and click Create.



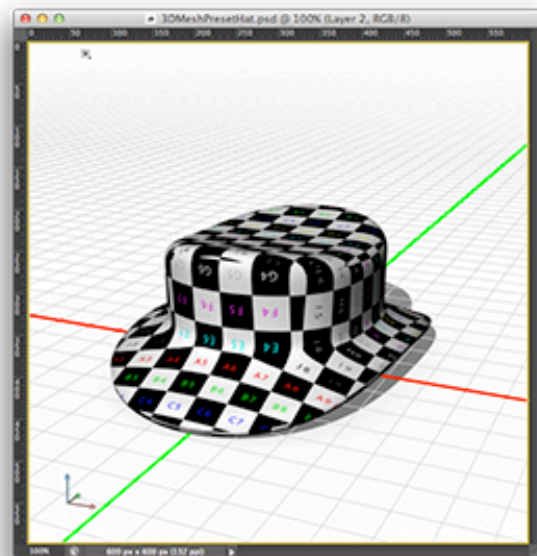
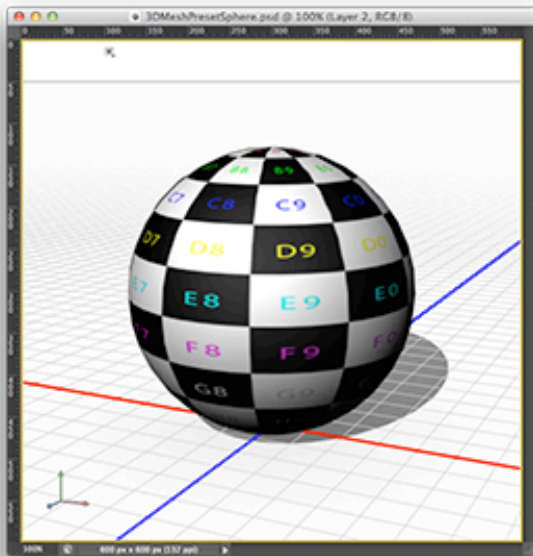
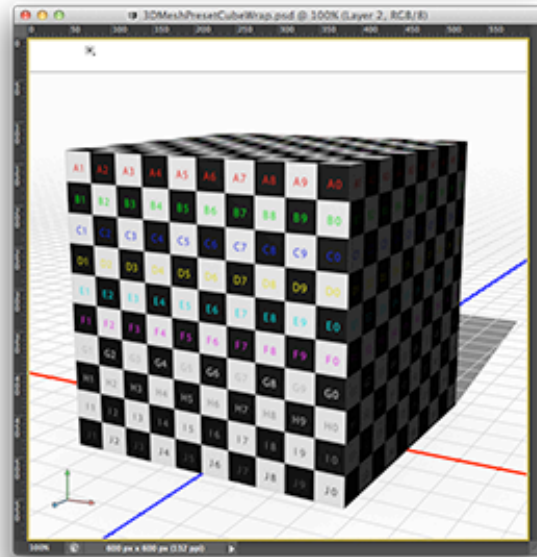
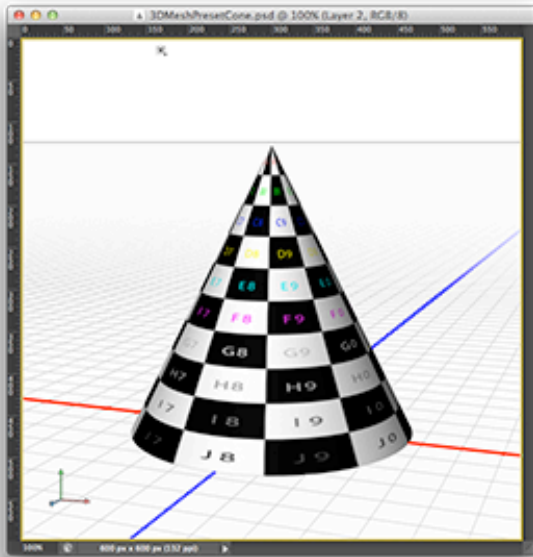
Test image converted to a 3D Postcard



Same 3D Postcard seen from the left—notice there is no extrusion (depth) on a 3D Postcard

Creating a Material on a Preset Objects

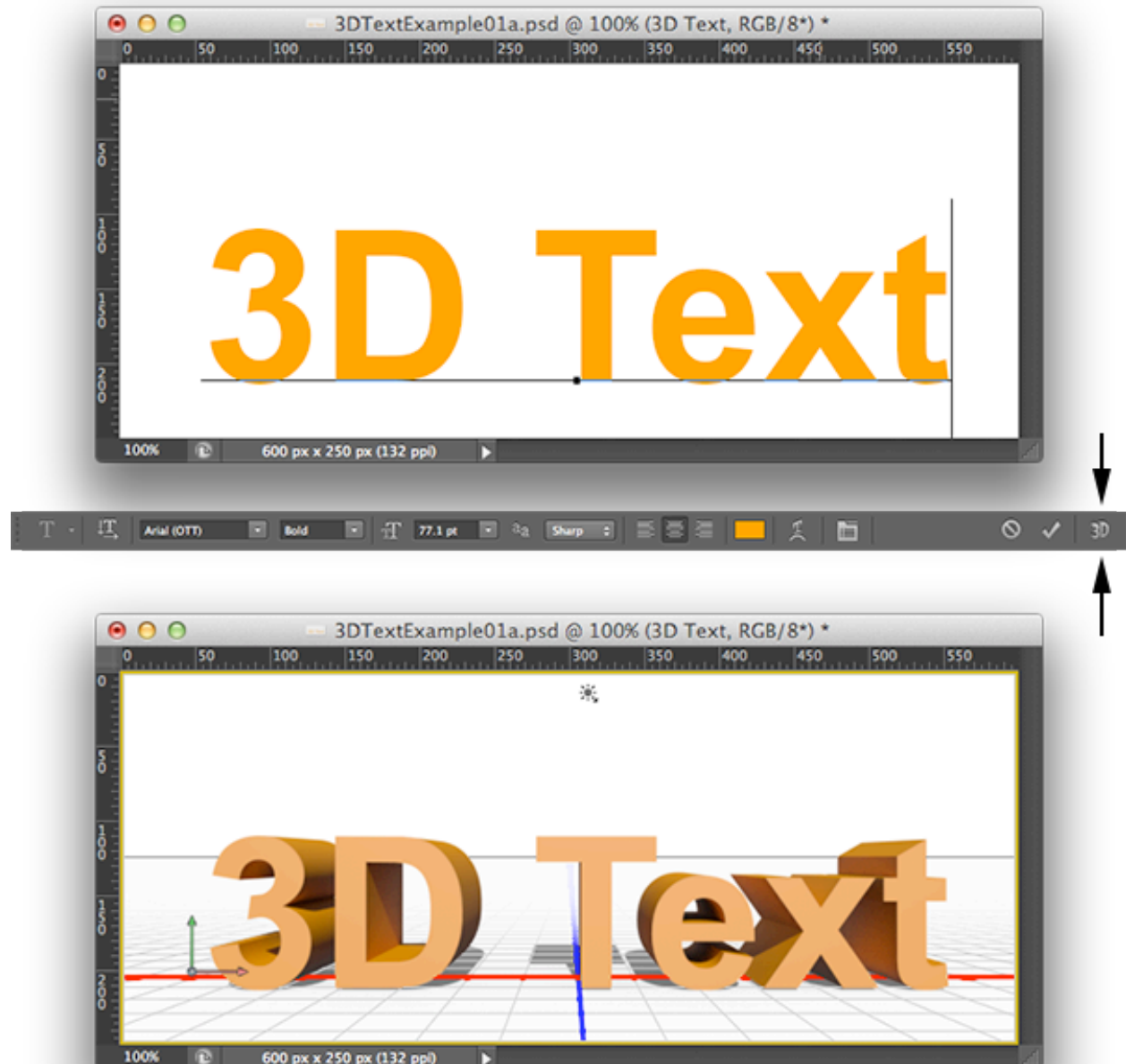
Photoshop ships with several shape preset for you to use, much like the 3D Postcard. These shapes include: Cone, Cube Wrap, Cube, Cylinder, Donut (torus), Hat, Pyramid, Ring, Soda (can), Sphere, and Wine Bottle. Simply select the layer from the Layers panel you want to use as the material then in the 3D panel select Mesh From Preset then choose the shape you want from the drop-down list and click Create.



Examples of Mesh Presets (clockwise from top-left) Cone, Cube Wrap, Hat, and Sphere

Making 3D Text

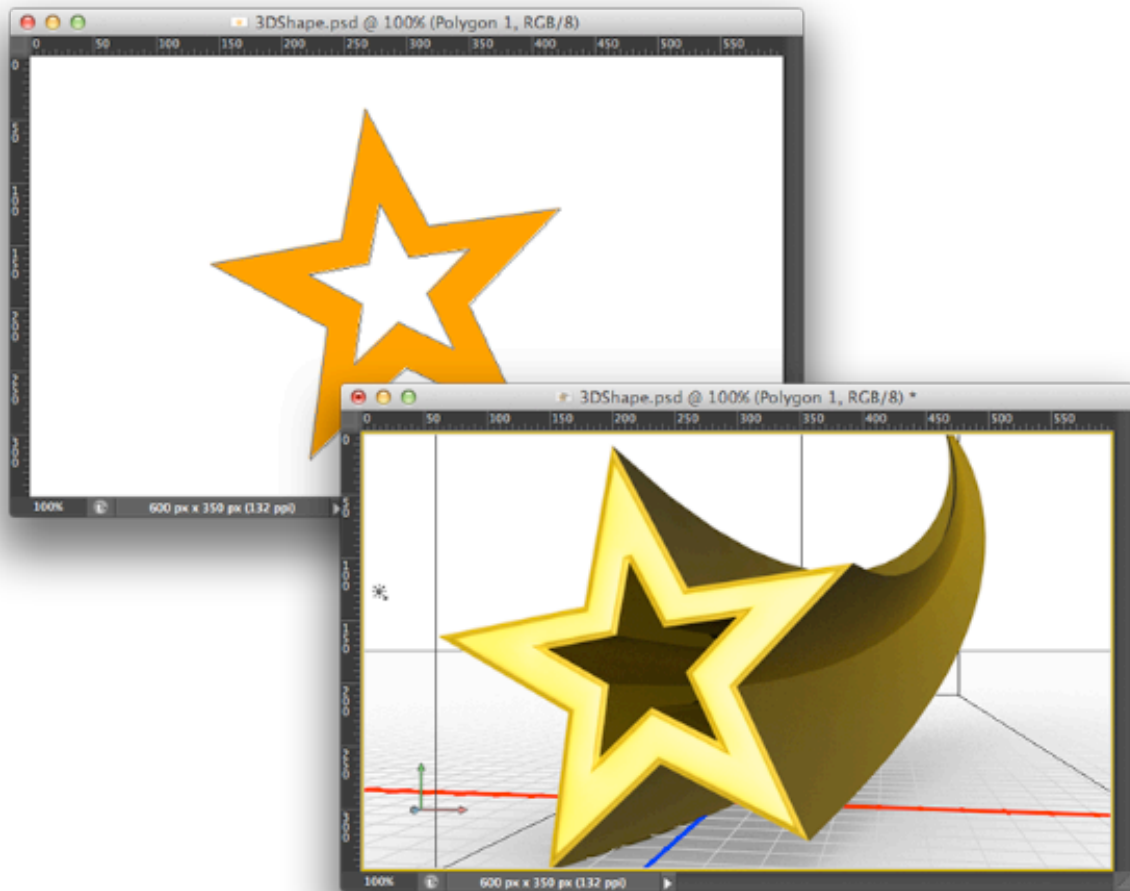
One of my favorite features is the ability to easily create 3D text in Photoshop. While working with the Text tool, instead of clicking the “check” to accept the text just click the 3D button that not only accepts the text changes, but converts it into a 3D text object. Best of all the text is still fully editable, allowing you to change the Character and Paragraph panel properties as well as editing the original text.



With the Text Tool (top), click the 3D button in the Tool Option Bar (middle), done! (bottom)

Making a 3D Shape

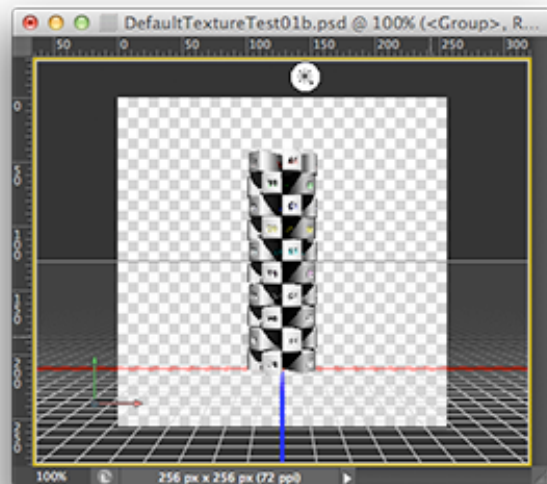
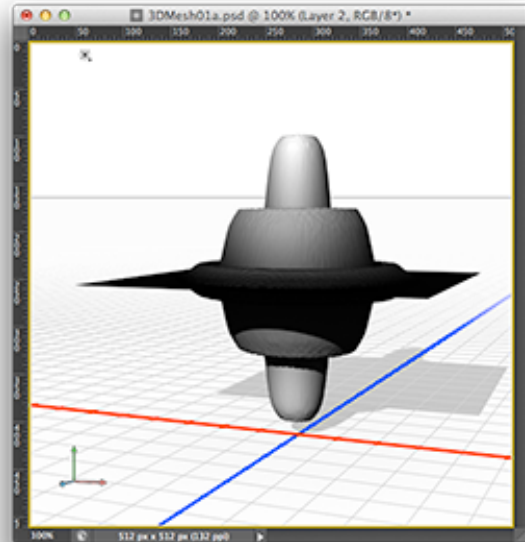
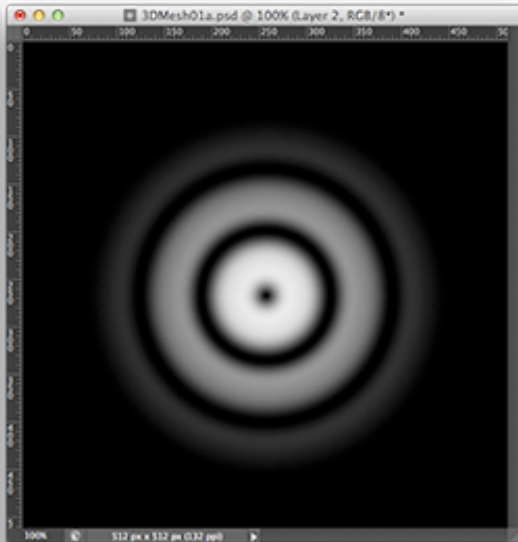
One of the coolest and most powerful features in Photoshop is the ability to create a 3D shape out of vector shapes, or create a 3D shape using any of the paint tools available. For example, with the Polygon tool you can create a star, then subtract another star from the center of it, and either use the 3D panel's 3D Extrusion method as outlined above or simply right-click on the shape and select Create New 3D Extrusion from the contextual menu.



A vector shape converted to 3D (3D Extrusion) with a gold material, twist and bevel applied

Making a Mesh Object From a Depth Mask (Greyscale Image)

Another powerful feature is the ability to create a 3D mesh from a depth map. A depth map is a greyscale image where white represents the highest point on the map and black being the lowest point of the resulting mesh shape. There are four types of meshes available: plane, double-sided plane, cylinder, and sphere



An example of a greyscale image converted to a double-sided plane (top) and the test image converted to a cylinder (bottom)

Loading and Importing

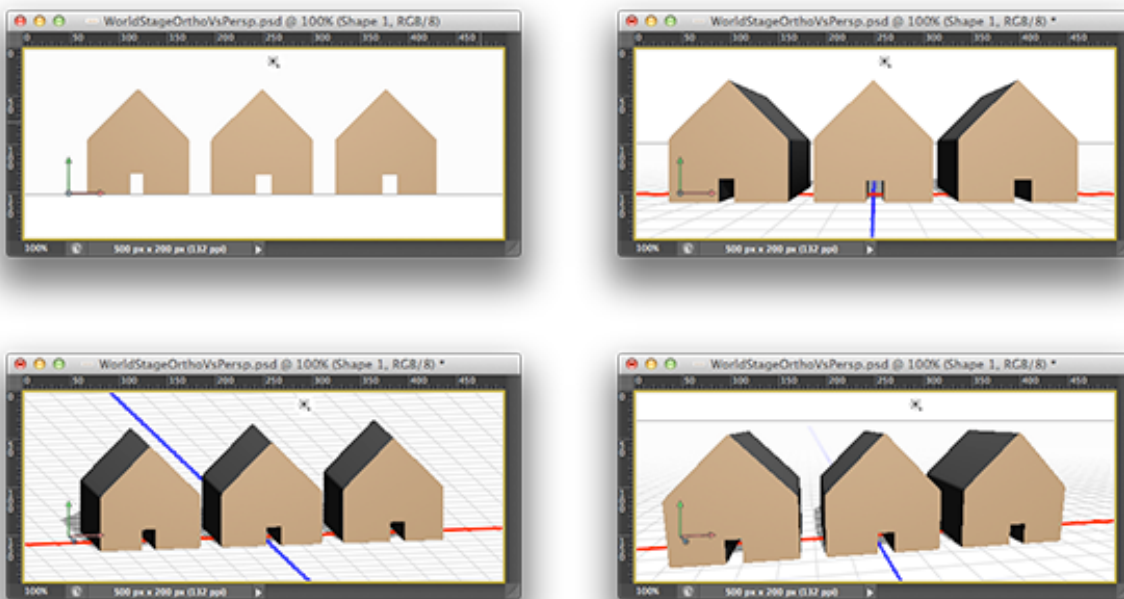
Along with creating 3D text, shapes and meshes directly in Photoshop, you can also import models and materials into your scene from external files. Photoshop handles the following 3D file formats: Wavefront (.obj), 3ds Max (.3ds), Collada (.dae) and Google Earth (.kmz).

Models can be imported from 3D applications such as 3ds Max, Maya, modo, CINEMA 4D, Poser, DAZ Studio, and SketchUp as well as from online services such as Google 3D Warehouse, TurboSquid and 3DVIA. Additional content can be access from within Photoshop by click on the 3D Menu→Get More Content.

The World Is Your Stage

One useful metaphor for explaining 3D layout is arranging items on the floor of a house for a photo shoot. One tool that you might use for planning this photo shoot is a floor plan. A floor plan has two properties that are very useful for 3D layout.

The first important property of a floor plan is that it is orthographic. An orthographic view is one that does not have any perspective in it. Normally, objects that are farther away get smaller. However, in an orthographic view this does not happen. Using an orthographic view turns the 3D layout problem into a 2D layout problem.

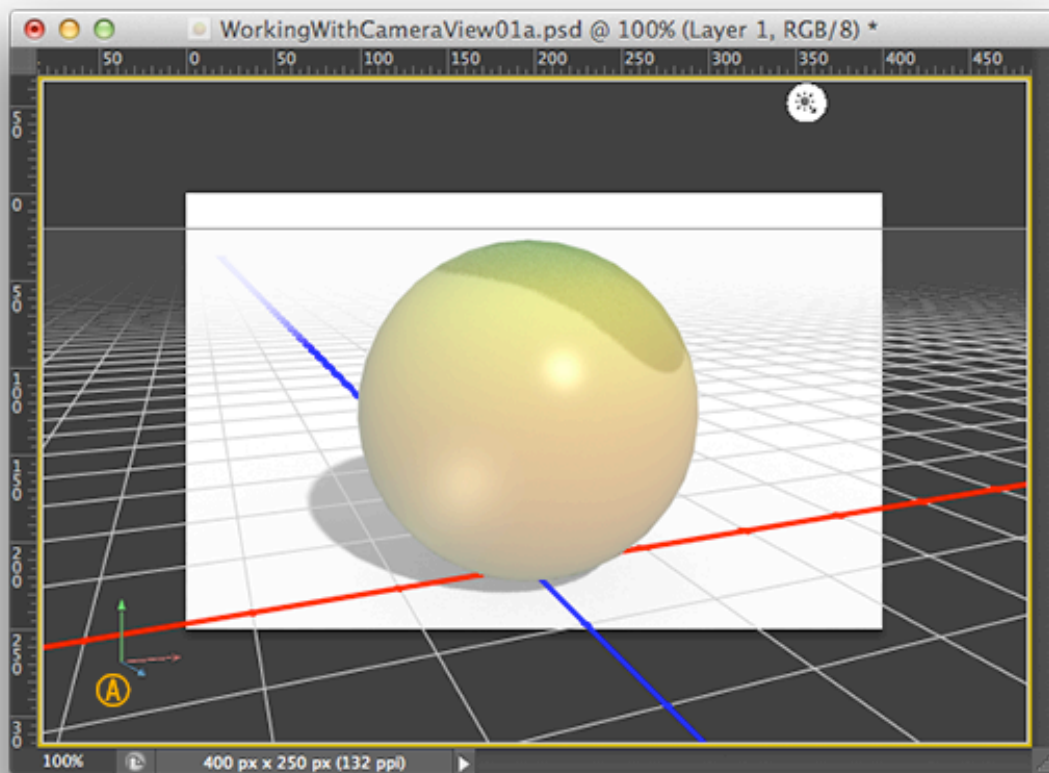


Examples of Orthographic vs. Perspective (clockwise from top-left) Orthographic front view, Perspective front view, Orthographic off-axis view, and Perspective off-axis view

The second important property is that regardless of where you end up wanting to take pictures from, the floor plan is a top view. This view gives you an overview of where everything in the house is. So you should think of your final rendering as one of the locations that you would shoot a photo from and the built-in top/bottom/left/right/front/back views are views for doing turning the 3D layout problem into a 2D problem.

Working with the Camera

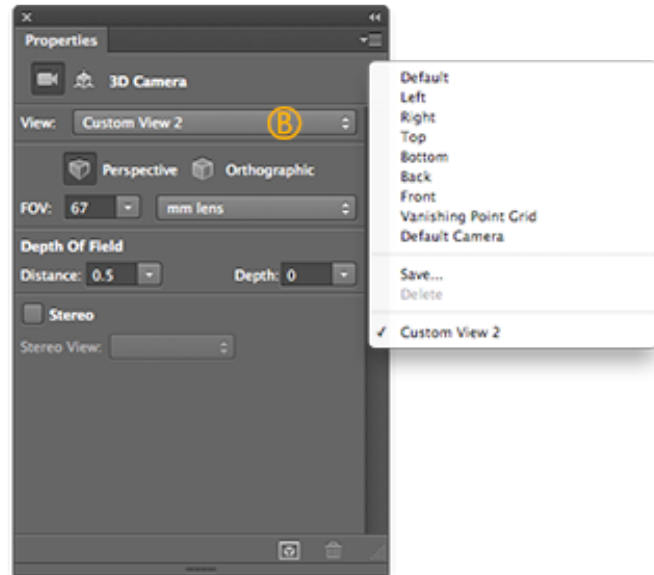
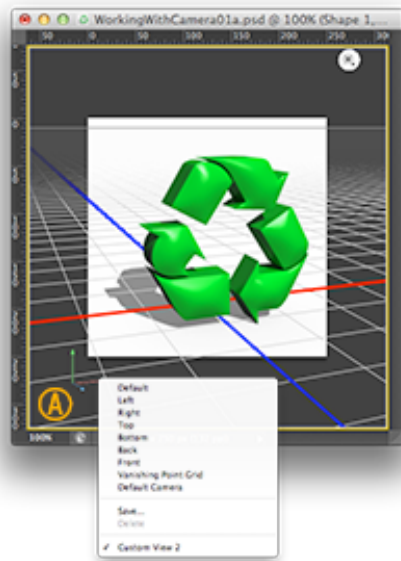
Using the above metaphor, your current view is the location and direction through which you are currently viewing the scene. The View Axis in the lower left hand corner of the screen is both an indicator of the orientation of that view as well as a control for modifying it.



View Axis (A), a gold border indicates working with a camera or view

The other way to modify the current view is to select it in the 3D panel. This can be done by either clicking on Current View in the panel or by clicking on your canvas in an area that does not contain any 3D geometry. When using any of these methods, the camera will move based on which 3D tool you have selected in the Move tool options bar. When Current View or a saved camera is selected the document view is framed with a gold border.

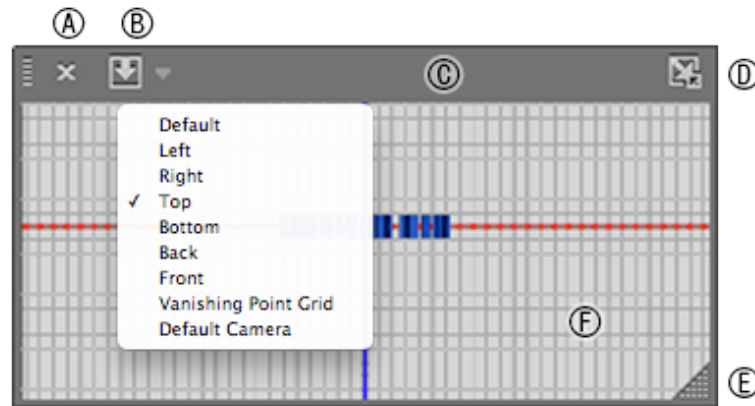
In addition you can also save the location of the current view and camera properties by either right-clicking on the View Axis and selecting Save or in the Properties panel when Current View is selected.



Right-click the View Axis in the document view (A) or click on the View drop-down in Current View properties (B) to load, save, select or delete views

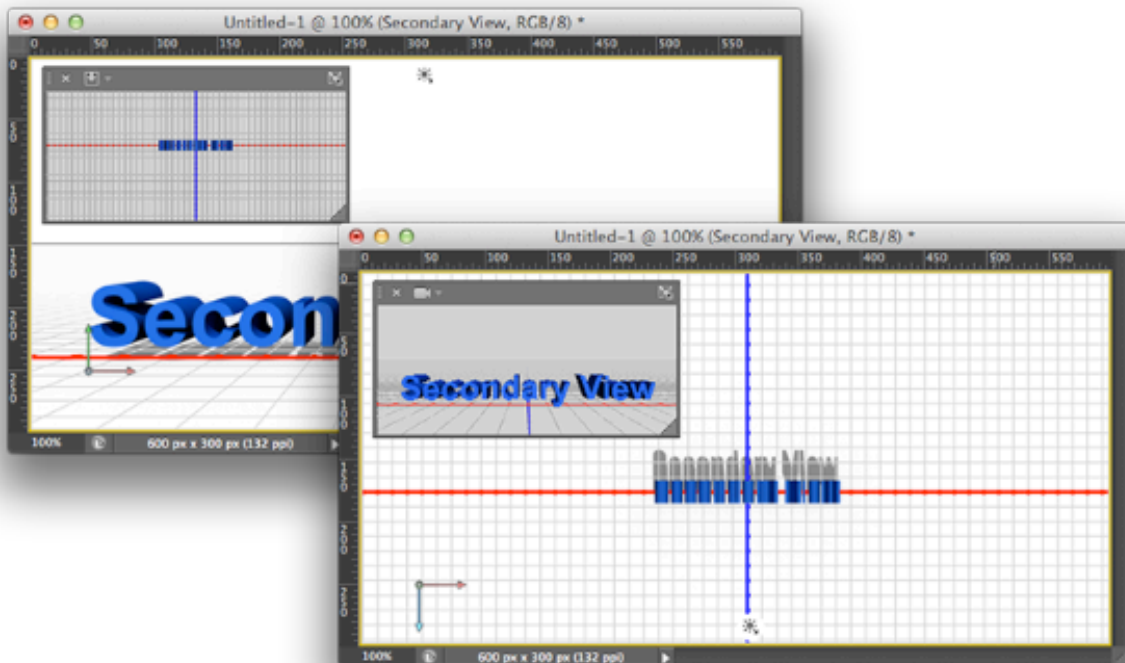
The Secondary View

Photoshop CS6 introduced the secondary view. This allows you to see your 3D layer from a different camera angle than what is currently in your document view.



Secondary view controls: (A) close secondary view, (B) select view (menu shown beneath), (C) drag bar (to drag the secondary view around), (D) swap views (swaps between secondary and main views), (E) resize view, and (F) view area (click and drag to pan the secondary view)

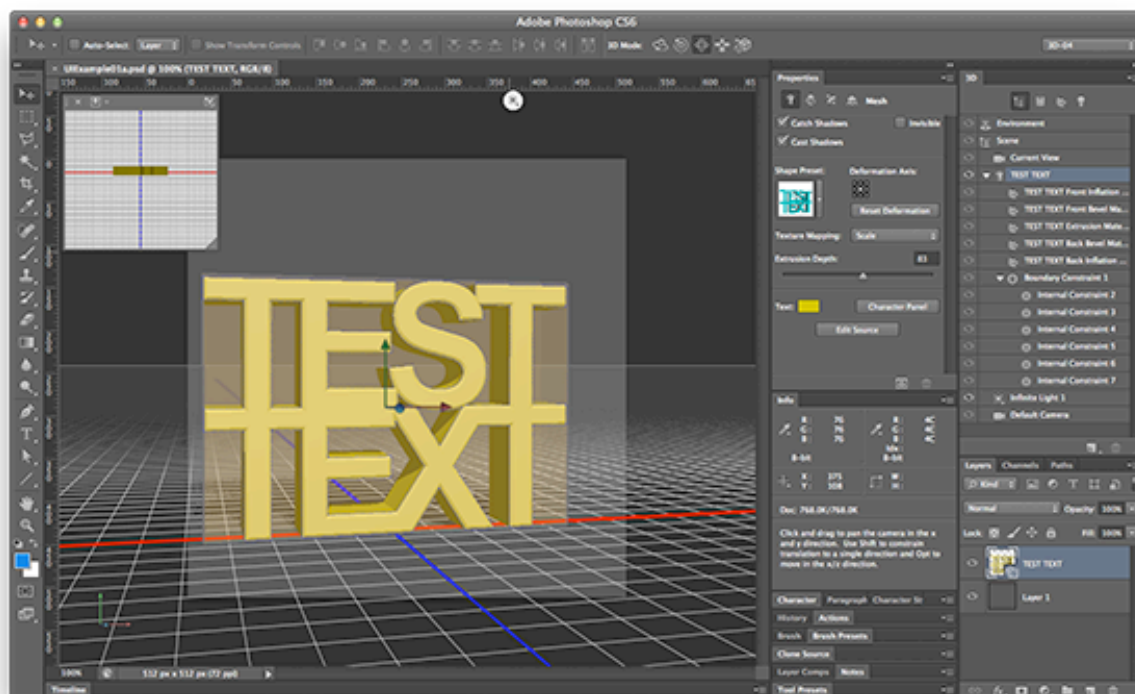
One of the most useful features of the secondary view is the Swap Views button (D above)—exchanging the main document view with the secondary.



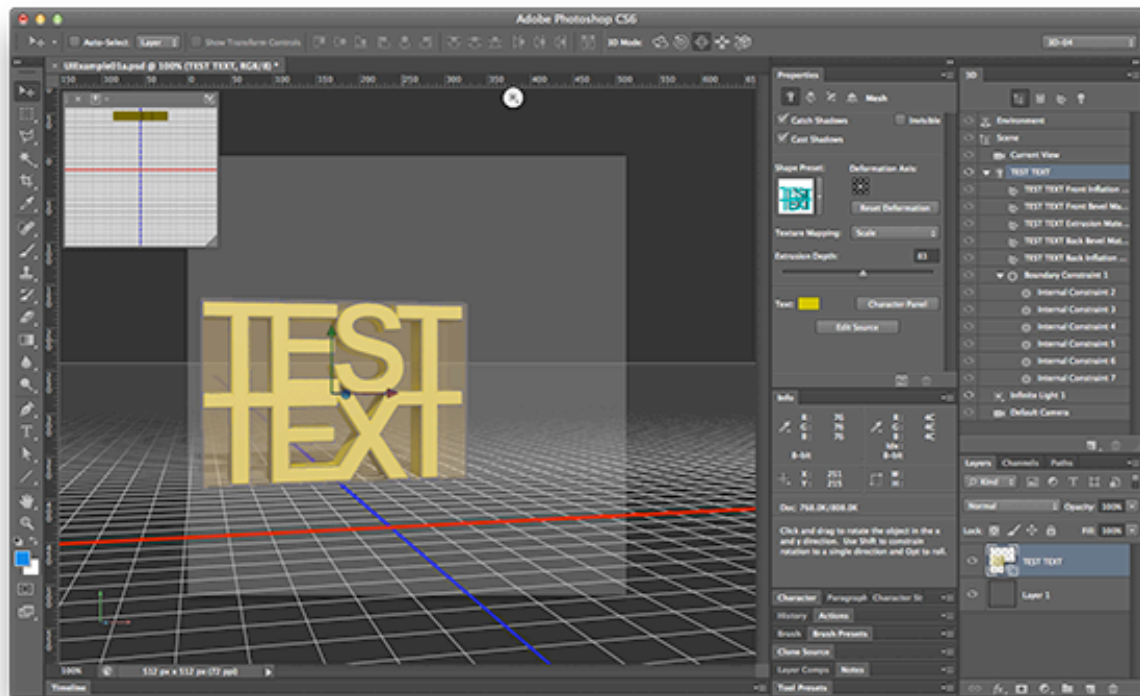
Moving 3D Objects

In Photoshop CS6, all of the dedicated 3D tools were eliminated and all of their behavior was made part of Photoshop's existing Move Tool. When this tool and a 3D layer is selected, the tool operates on the currently selected element of the 3D scene. Selecting items in the 3D scene can be done by either selecting them in the 3D panel or by single-clicking them directly on the document view.

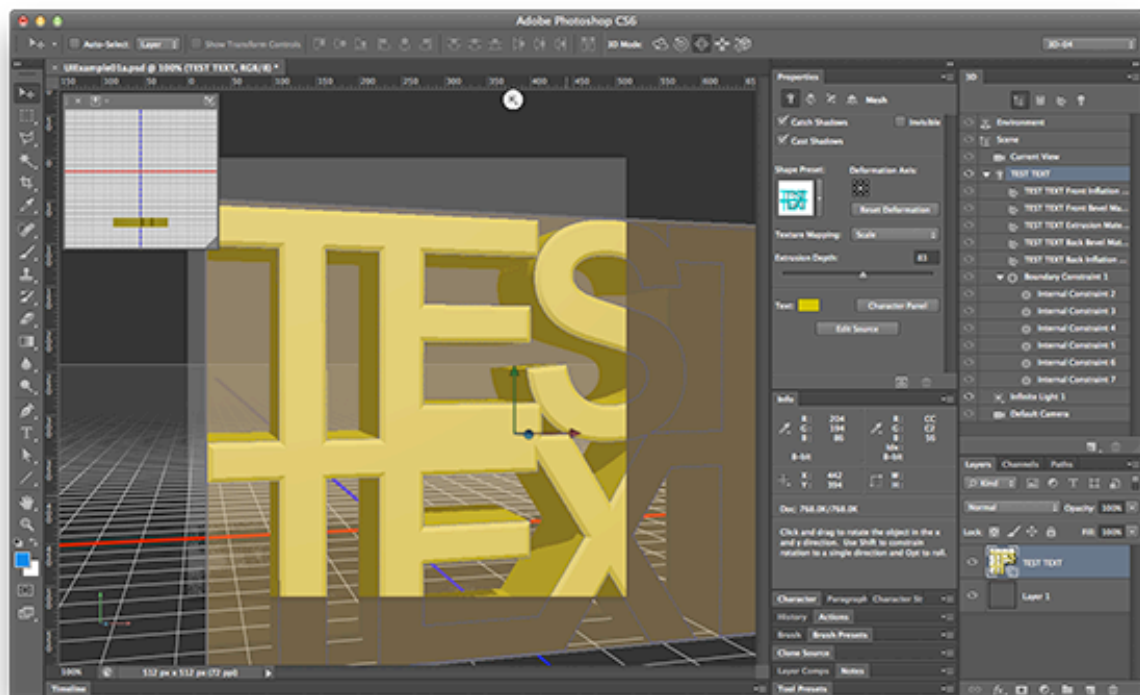
Once an item is selected, the user can either click and drag on "nothing" (outside of the cage) or operate on the on screen controls (cage) that appear around the selected item.



With the 3D text selected click and drag on front of the cage to move along the Z axis...



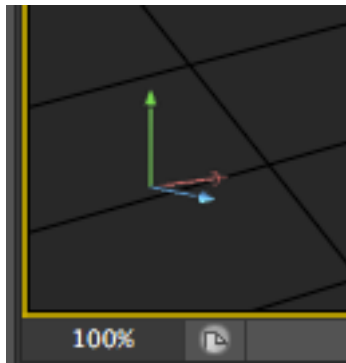
...move the mouse away from you to “push” the cage away...



...move the mouse towards you to “pull” the cage towards you

Clicking on the edge of the cage moves the cage along a perpendicular plane while clicking near the edge of the cage rotates around its parallel axis.

Remember, you can always move the 3D camera (current view) regardless of what is selected by clicking and dragging on the View Axis tool in the lower left corner of the document window. Doing this will move the current view using whatever 3D tool mode the Move tool is currently in.



View Axis is located in the bottom-left corner of the document view

Living in a Material World

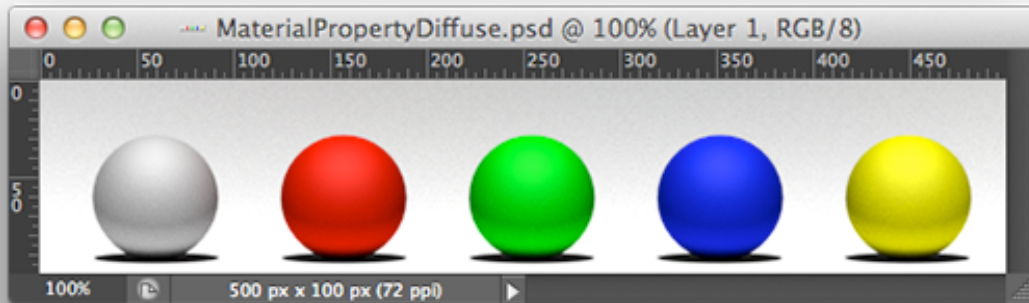
Materials are one of the most important aspects of a 3D scene: careful selection and application of materials can provide a sense of realism, a stylized cartoonish look or almost anything in between.

Material Properties

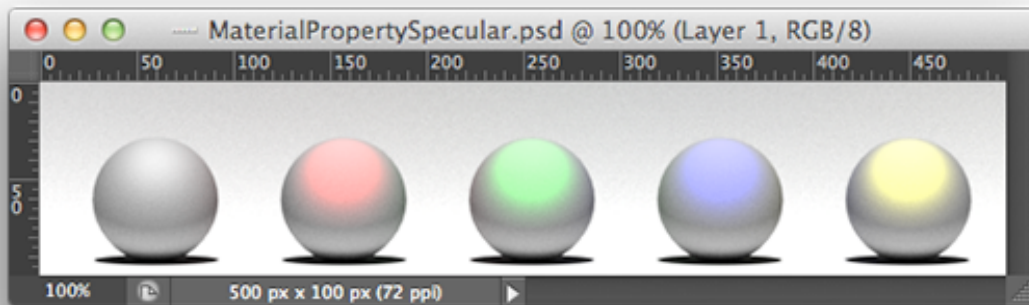


Selecting a material shows its properties in the Properties panel and provides a way to load and save materials. You can multi-select materials and adjust their properties all at once.

Diffuse color : The color of the surface under white light. It is the color of the object itself rather than a reflection of the light.



Specular color : The color of the specular highlights. Specular highlights are seen when a surface has a high shine value.

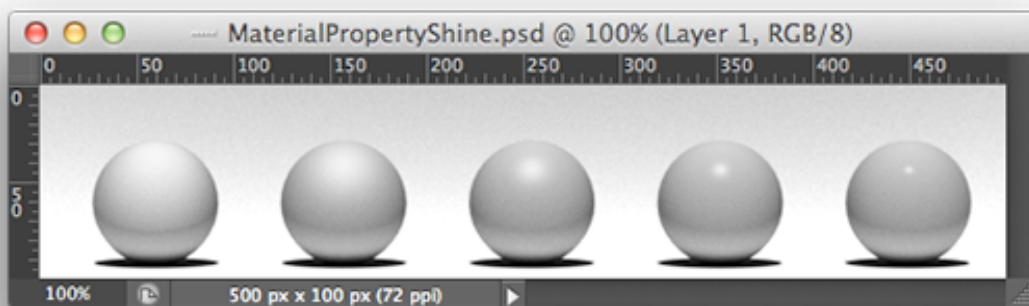


Illumination color : Colors with non-black illumination colors will emit light in the color specified.

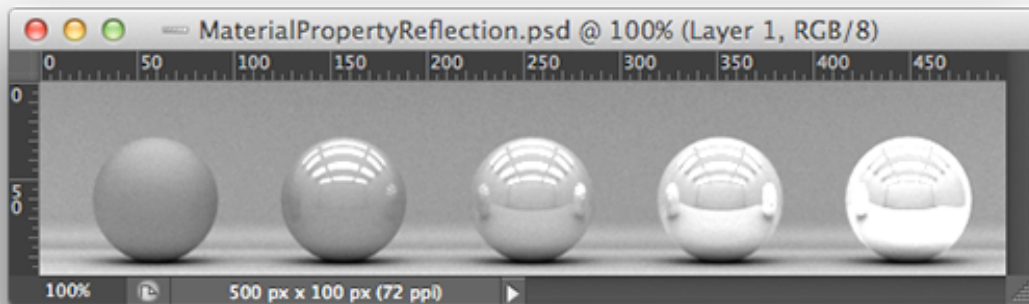


Ambient color : Ambient color is the color of an object where it is in shadow. This color is what the object reflects when illuminated by ambient light rather than direct light. The ambient light for the scene can be found in the Environment properties.

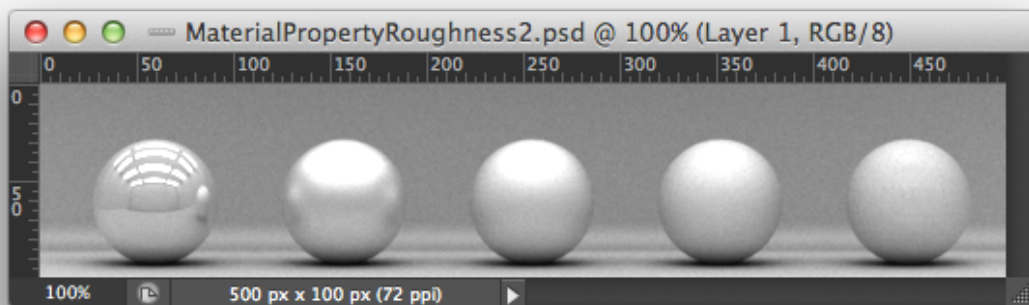
Shine : Shine controls the size of the specular highlights. The shinier a surface it is the larger its specular highlights are.



Reflection and Environment: Reflection controls how much of the environment the surface reflects out. For example, chrome is a highly reflective surface. Note that with the exception of the ground plane and environment maps, reflections are not rendered as part of the interactive preview. You must render in order to see them.



Roughness : Roughness can be thought of as how much the surface will blur its reflections and highlights.



Bump and Normal: Bump and Normal both require a texture. These textures can be used to simulate detail in the surface of the object. Bump maps are grayscale and push the surface in and out while normal maps can push the surface in any direction but they are harder for an artist to control.

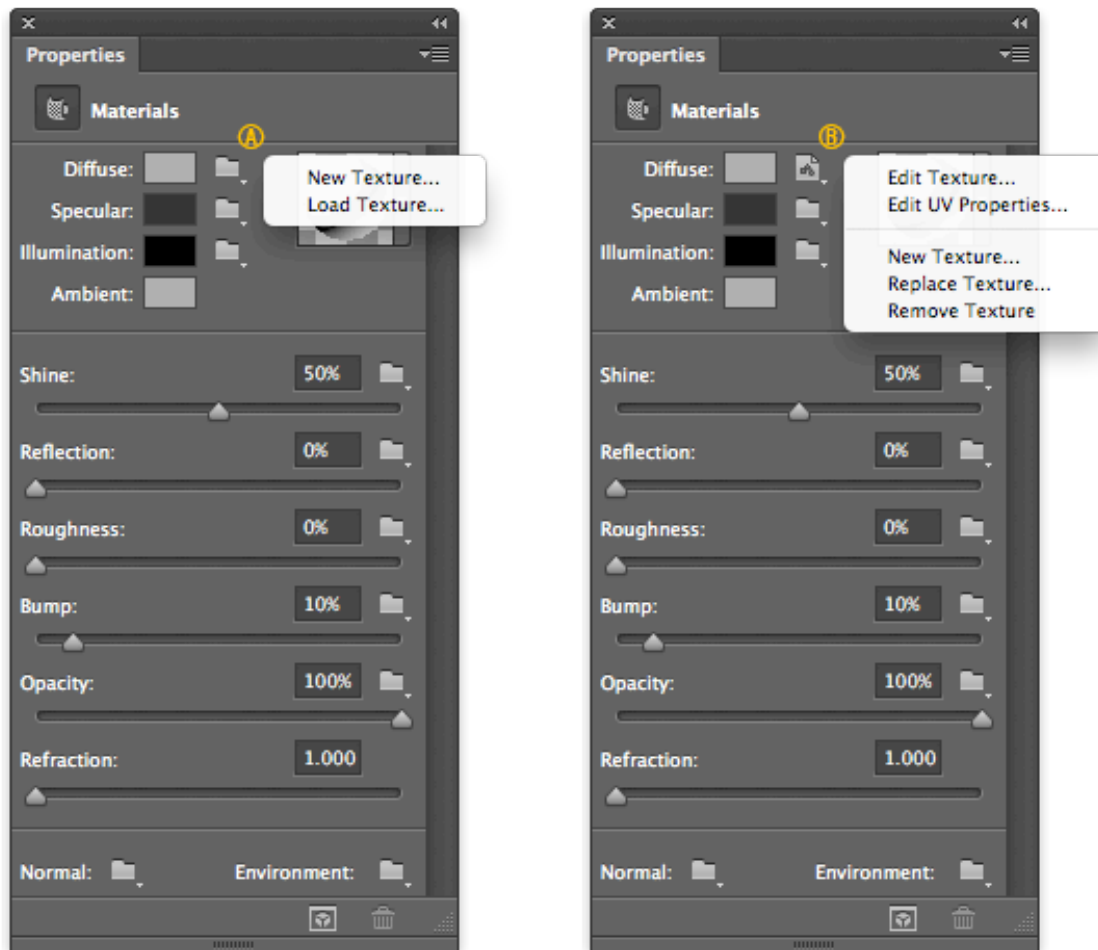
Opacity : Opacity in 3D is the same as it is in 2D: it controls how much light is allowed to pass through the object. Objects that are 100% opaque can not be seen through at all and objects that are 0% opaque are invisible.

Refraction : Light that passes through objects that are not 100% opaque may bend based on what kind of material the object is. How much the light bends is determined by the index of refraction.

Working with Textures and Images

Textures allow you to better control aspects of a material's properties. All of the properties except Ambient and Refraction allow you to load an texture image.

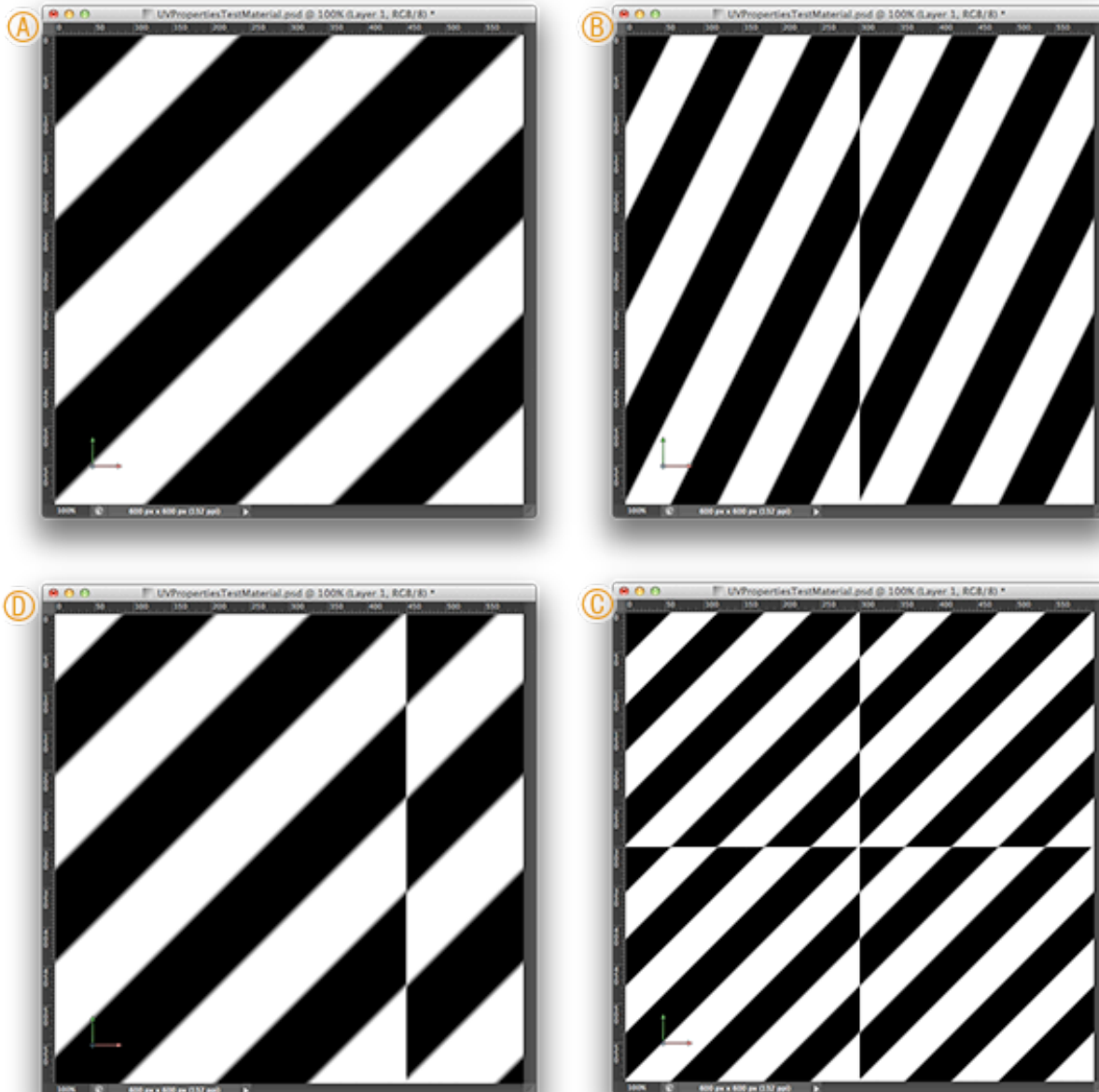
To load a texture click on the File/Folder icon to the right of the material's property and select Load Texture... or New Texture... to create a new texture.



When a texture is loaded the Folder icon changes to a File icon and additional menu items are exposed such as Remove Texture, Replace Texture, and Edit UV Properties. Hovering over the File icon reveals a thumbnail of the loaded texture and file info.

Edit UV Properties.

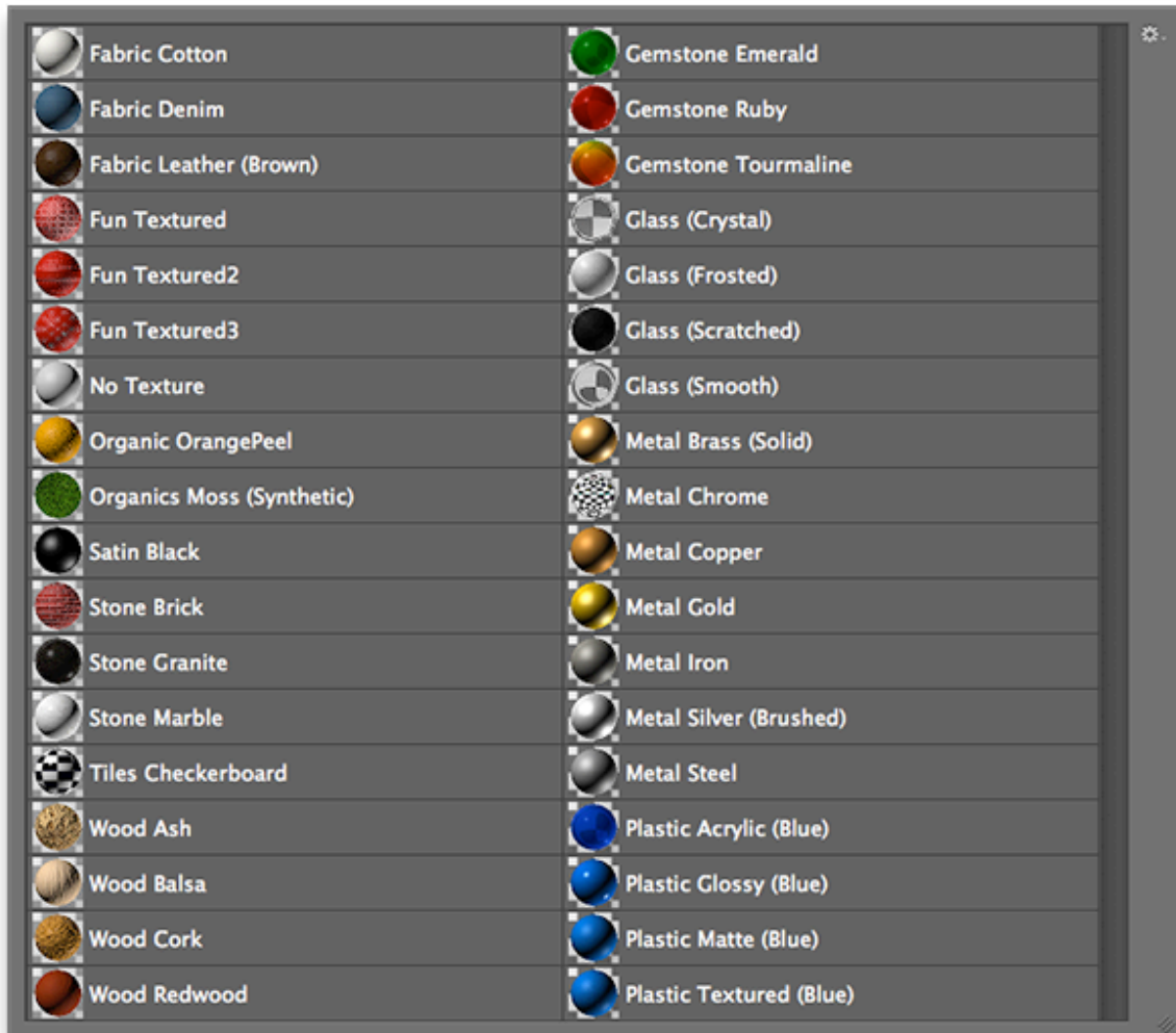
UV Properties allow you to control how a texture is applied to the surface of the model. The two important things to note are Scale and Offset. Scale affects how the texture is stretched or tiled across the surface. A value of 50% stretches the image to show only half of the texture, while a value of 200% tiles the texture twice. Offset shifts the position of the texture and can also be thought of as Horizontal and Vertical offset. Offset slides the texture along the X and or Y axis.



Examples of changing UV properties (clockwise from top-left); the original texture (A), U Scale set to 200% (B), both U Scale and V Scale set to 200% (C), and U Offset set to 25% (D)

Materials Presets

Photoshop ships with 32 default material presets and there is more than 100 additional materials that you can download from within Photoshop by selecting 3D Menu → Get More Content...



List view of default materials; Default (left column), Default (for Ray Tracer) (right column)

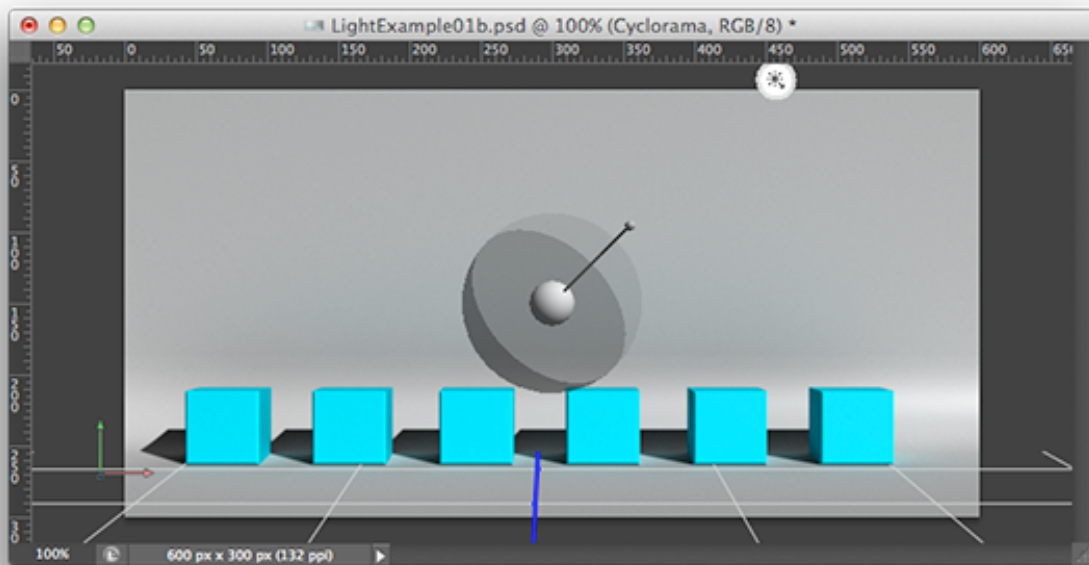
*In each future editions of **Photoshop Dimensions** we will explore materials in greater detail, reviewing the default materials as well as the additional materials and create new materials from scratch. The power of Photoshop's materials can also be leveraged by traditional (2D) designers providing an endless amounts of creativity to your designs.*

Working with Lights

There are three basic types of 3D lights: point, spot and infinite, each having their own uses and properties.

Basic Lights

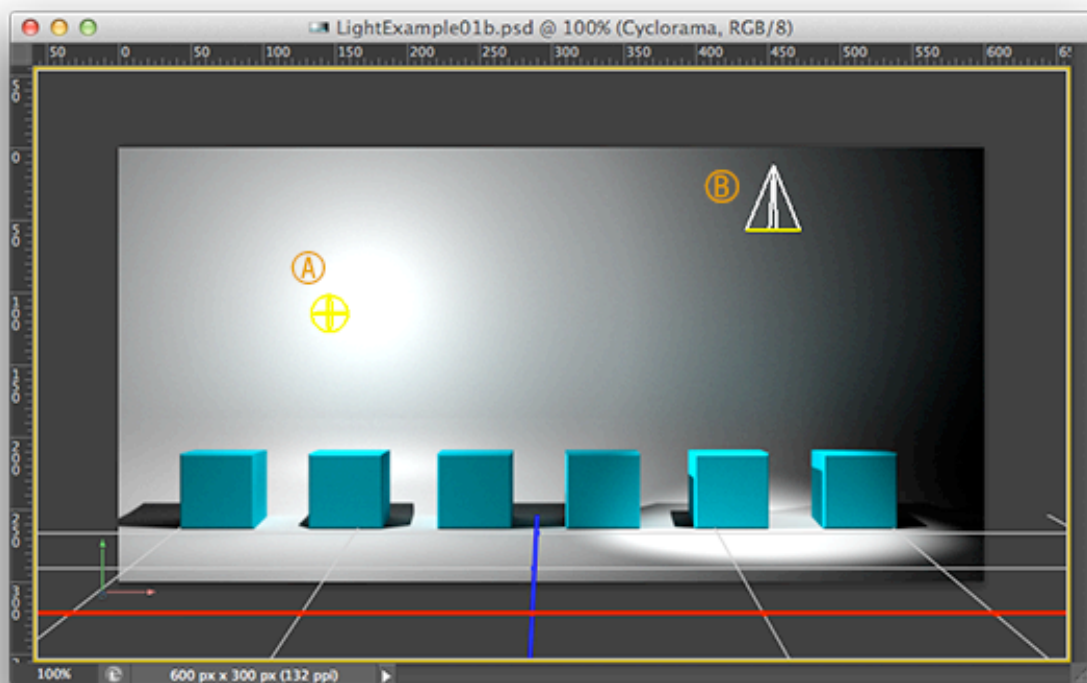
An infinite light sends light into the scene from a given direction. It is so far away that local changes in the position of objects in the scene have no effect on how they are lit by an infinite light source. The sun is a good example of an infinite light. Moving items on the ground doesn't change how they are lit because the sun is so far away.



Sample stage lit with a Infinite Light (Infinite Light HUD overlay visible)

A spot light is a light that has a location, direction and cone that defines how wide and deep of an area it effects. A flashlight is a good example of a spot light. If you shine a flashlight in a dark room, only the objects that fall within the cone created by the flashlight are effected by it. Additionally, because the light it generates is relatively weak as compared to something like the sun, objects that are far enough away are not effected by it. How far it's light reaches is called it's falloff.

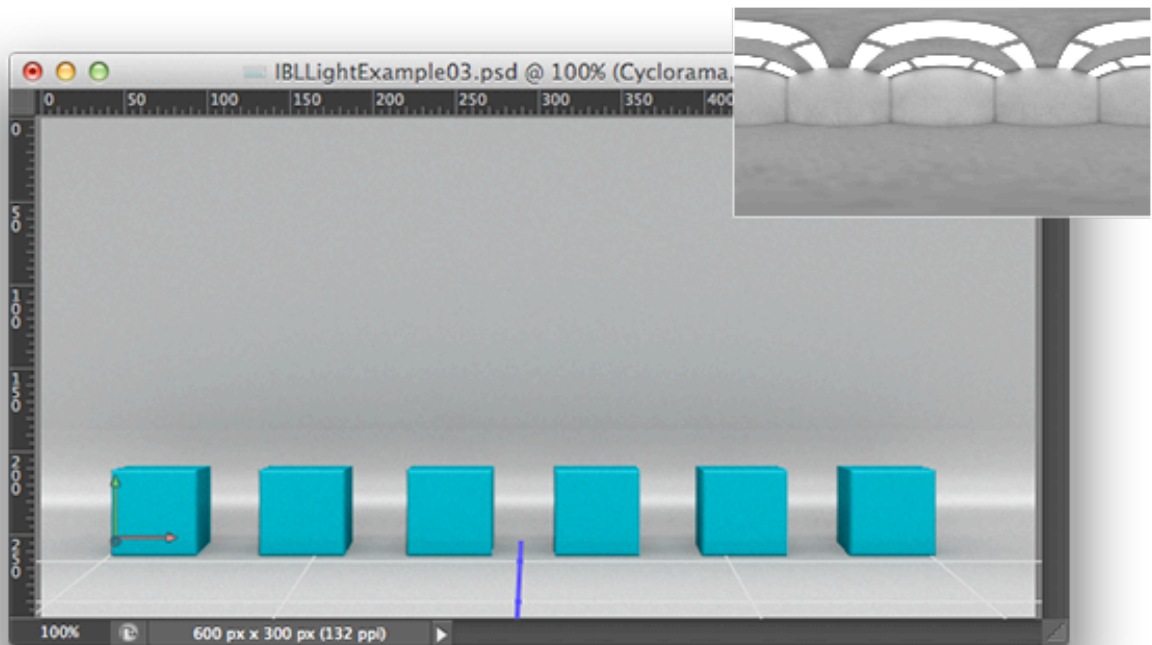
Finally, a point light is a light that has a location but no direction—it illuminates evenly in all directions. Like a spot light, it also has a falloff.



Same stage lit with a Point Light (a) and a Spot Light (B)

Image Based Light (IBL)

In addition to the three basic lights, you can use an Image Based Light (IBL) to light a scene. IBLs are normally 32 bit equirectangular images with a width-height ratio of 2:1 that are panoramic: 360° horizontal view and 180° vertical view. An IBL acts like a sphere around your scene and lights it from all directions based on the color and intensity of the IBL's image. The IBL also shows up in the reflections of your materials if the Reflection value is greater than 0%, providing an easy way to creating realistic effects without having to use Reflection texture maps.

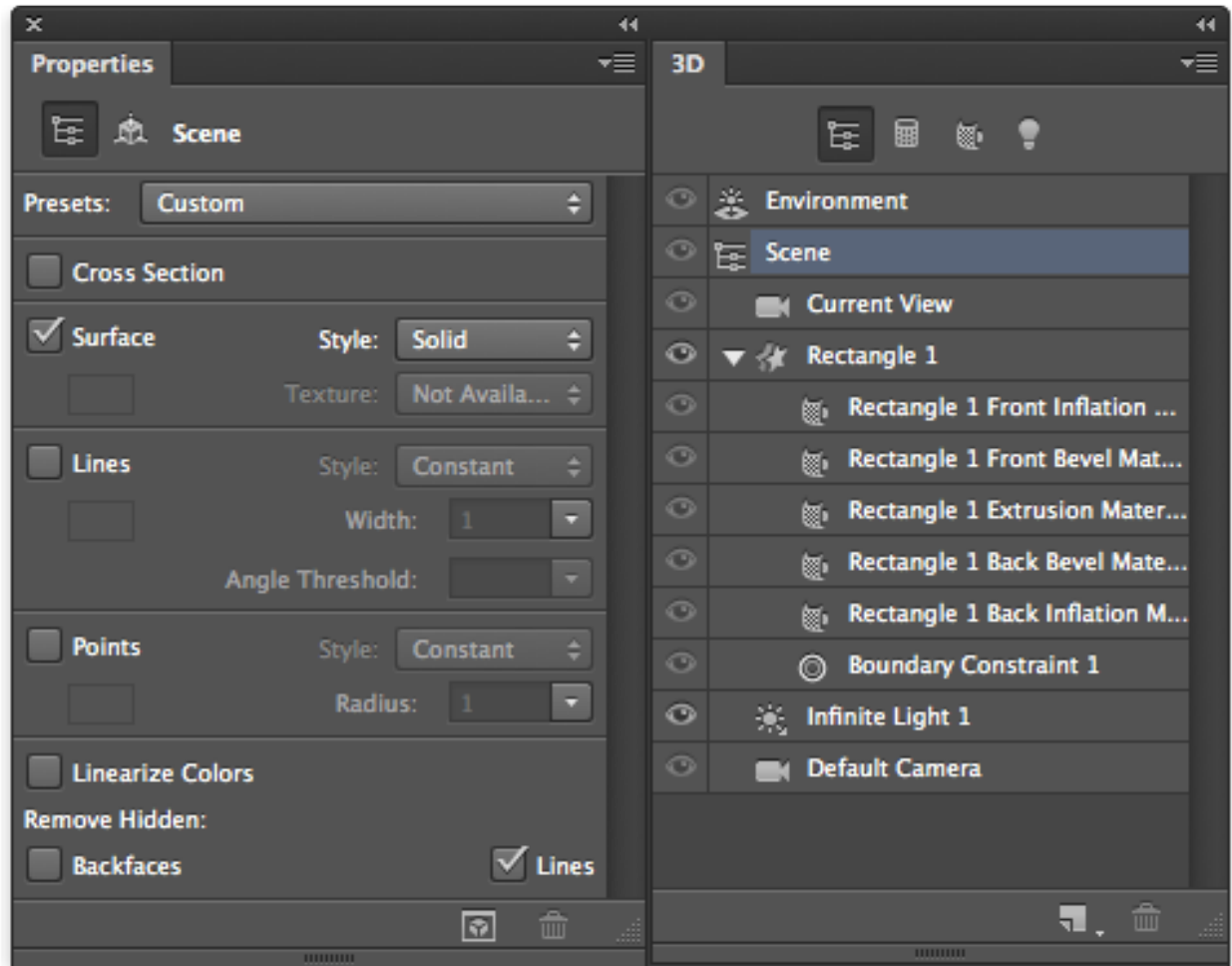


Same stage lit with an IBL (inset image)

Render Settings

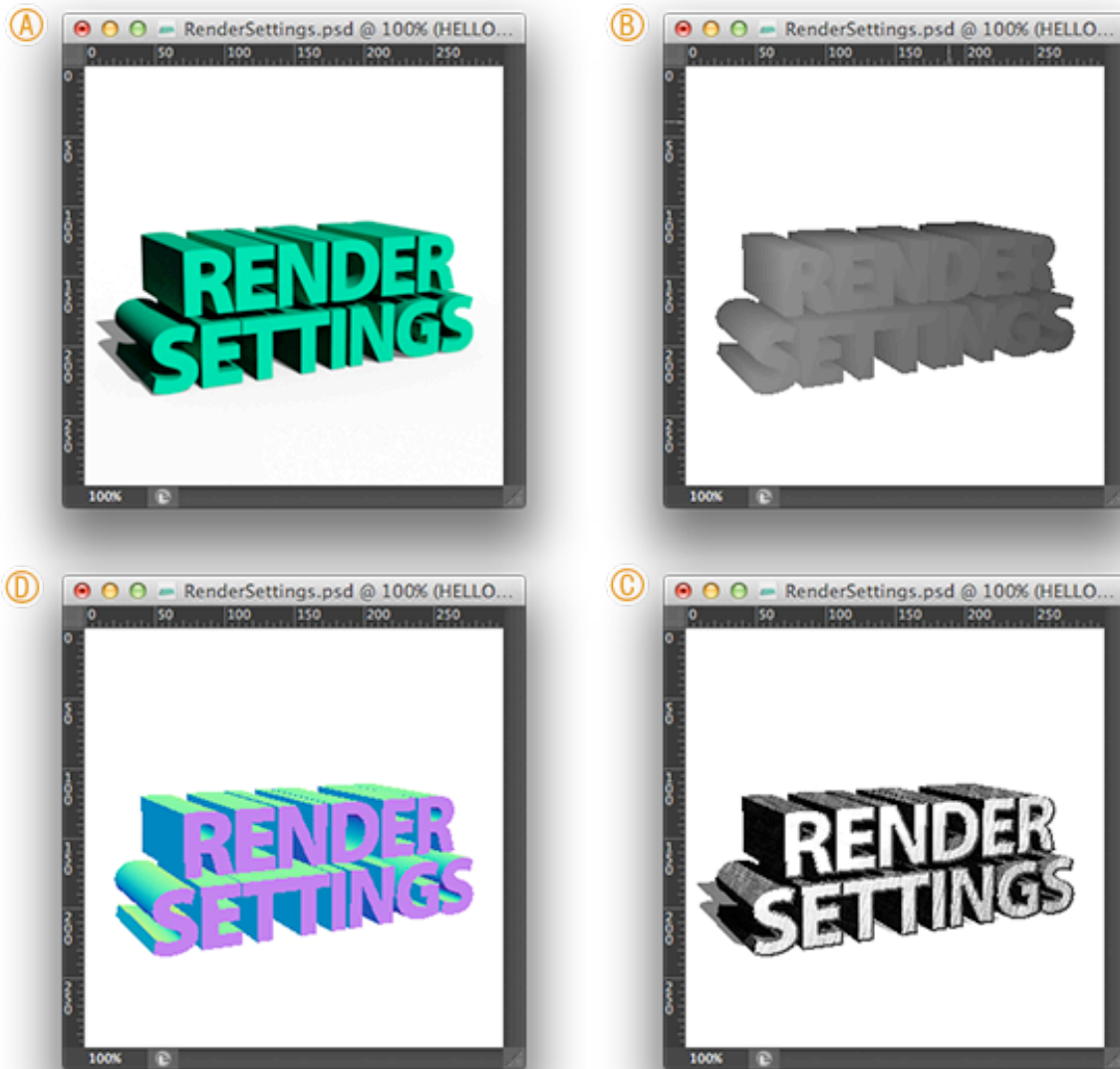
The Photoshop 3D engine has many properties that you can control. In addition to surface rendering, it can render lines, points, and cross sections. There are also many rendering styles including illustrative, sketch, and cartoon.

These settings can be found in the Scene properties which you can reveal by selecting the Scene item in the 3D panel. When Scene is selected a green border.



Property panel and Scene panel with Scene selected.

There are several aspects of the rendering you can adjust including Surface, Lines, Points and Cross section. Surface deals with the ray tracer and how it renders the light and materials in the scene, while Lines and Points deal with the geometry of the mesh. Cross section allows you to apply a Surface preset to one side of the view and Lines (and/or Points) to the other side. This can be use for cut-away or mechanical illustrations, architectural renderings or a variety of other stylized effects.



Examples of Surface render styles (clockwise from top-left): Solid (A), Depth Map (B), Sketch (C), and Normals (D)

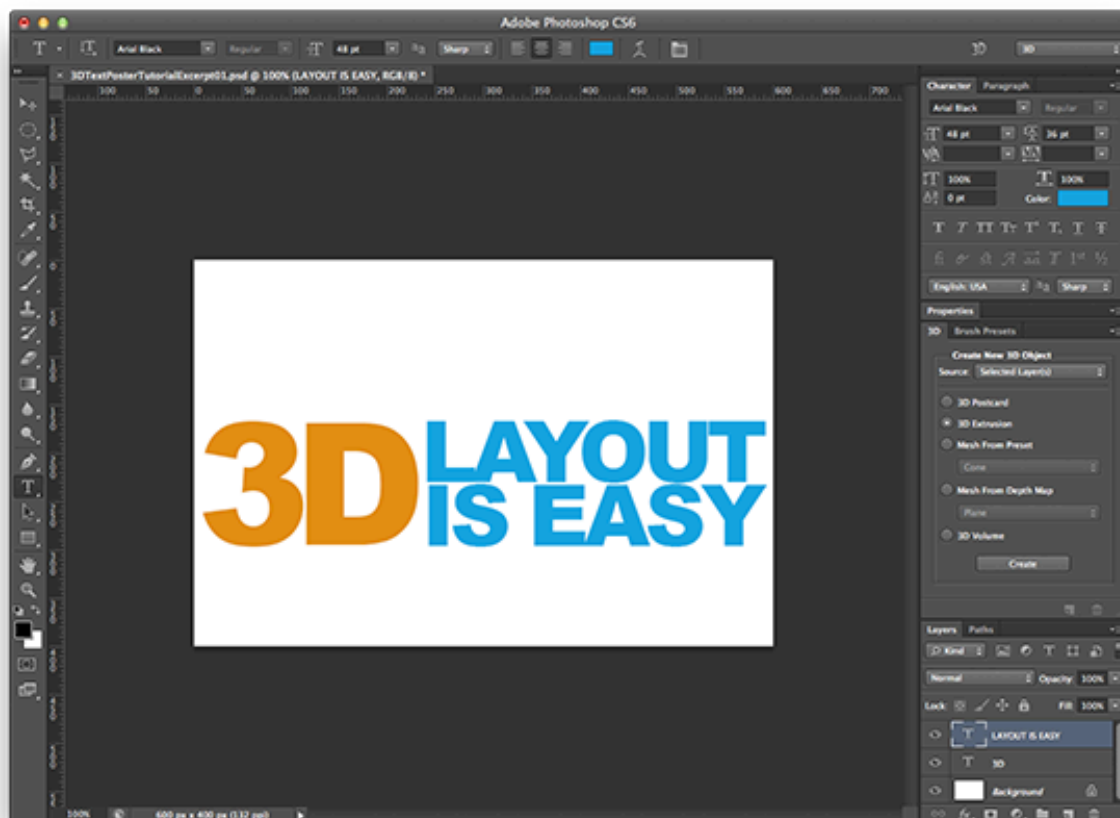
Preview of 3D Text Layout Tutorial

The following is a excerpt of a tutorial in the next issue of *Photoshop Dimensions* that covers creating 3D Text, merging 3D Layers into one 3D Layer, laying out 3D Objects, lighting the scene, rendering, and more in greater detail. Enjoy the preview.

- [Step 1 — Convert Text To 3D](#)
- [Step 2 — Merge 3D Layers](#)

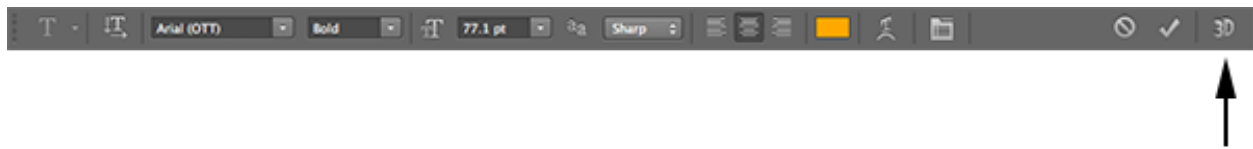
3D Text Poster Tutorial (Excerpt)

We will start with two text layers that are both the same height - one says 3D the other says LAYOUT IS EASY as seen below:



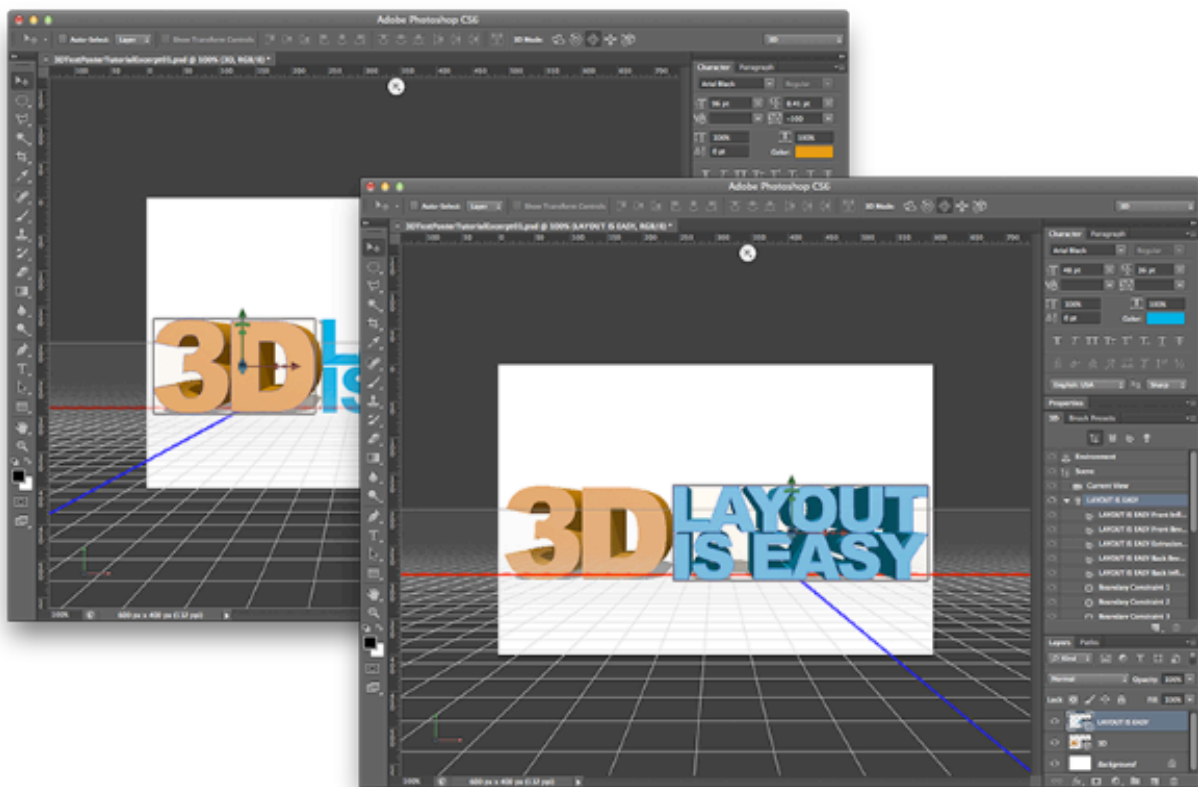
Step 1 — Convert Text To 3D

We will then convert these two layers into 3D layers using the 3D button in the Text tool:



Note that you can also create 3D from text in many other places. For example:

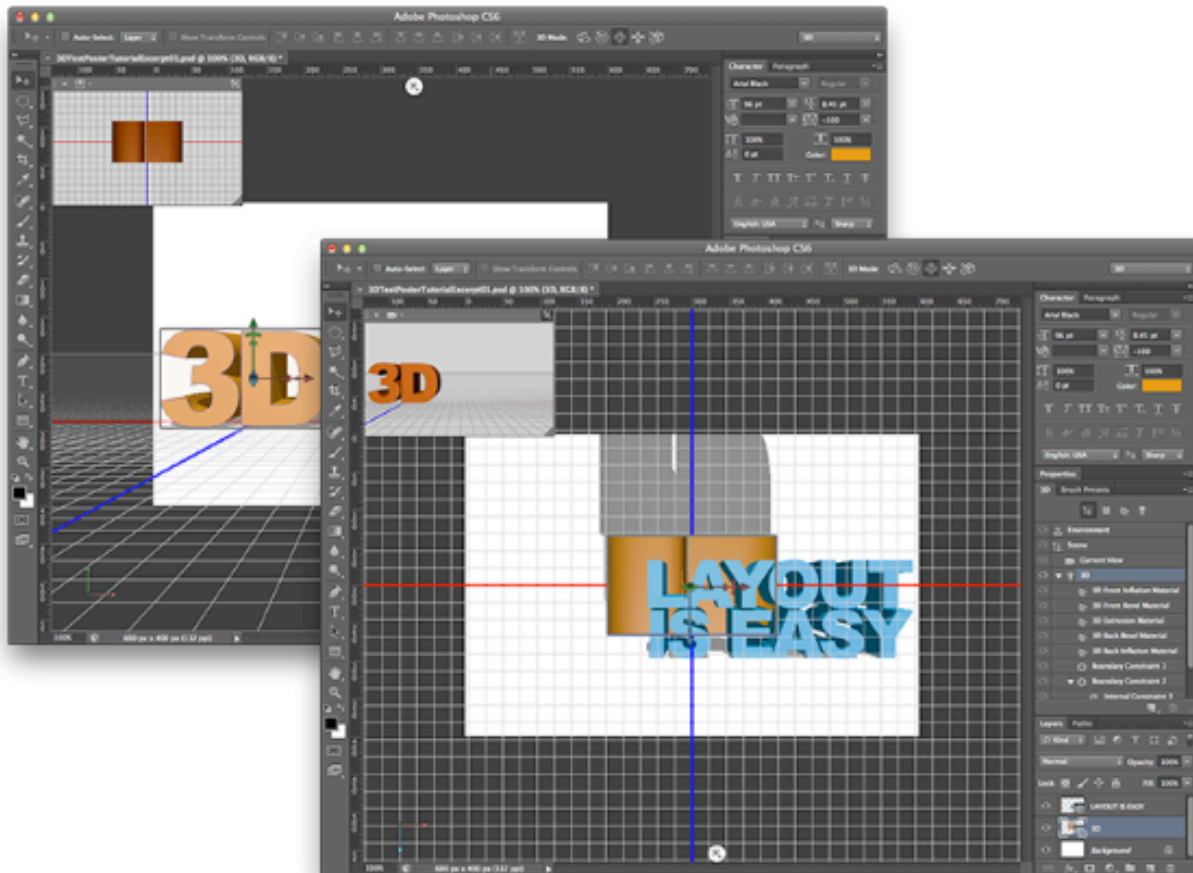
- Type Menu → Extrude To 3D
- 3D Menu → New 3D Extrusion From Selected Layer
- 3D Panel → 3D Extrusion and Press Create
- Layers Panel Context Menu → New 3D Extrusion From Selected Layer



Converting Text to 3D Text (3D Extrusion)

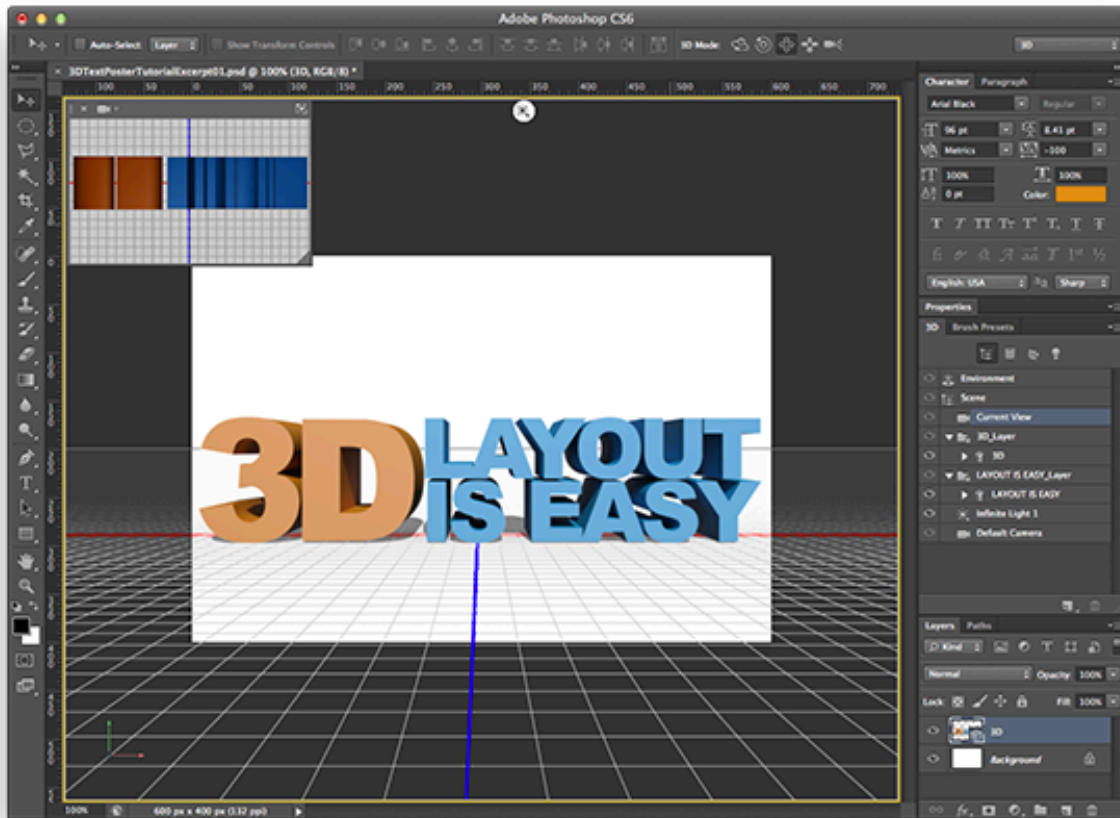
Step 2 — Merge 3D Layers

We now want to merge these two separate 3D layers into a single 3D scene. I prefer to do all of my 3D layer merging in an orthographic view. In this case, we will use the top view. So, for the next step select each 3D layer and click the Swap Main and Secondary View button.



Swapping between main and secondary view

Once you have done this, you can either select both layers (Shift-click the layers) and select 3D→Merge 3D Layers or you can just select the top layer and select Layer→Merge Down (⌘-E Mac / Ctrl-E Windows). Your screen should look something like this:



Merged 3D layers

Look for our next issue where we will show you how to get from this simple text example to the final result:



3D Text Layout Tutorial final rendered image

Welcome to a New Dimension

We hope you have found the introductory issue of *Photoshop Dimensions* useful. It is our goal to provide our readers with all of the information they need to get the most out of the 3D functionality in Photoshop. Every issue will include tutorials covering topics including creating meshes, layout of 3D objects, materials, lighting, rendering and output.

Coming Up Next

In our next issue of *Photoshop Dimensions* we will continue our tutorial on 3D Text and explore working with lighting, cameras, and rendering the final image as well as a tutorial on creating your own materials using smart filters.

For more information, visit us at www.photoshopdimensions.com and sign up for our mailing list (we promise not to spam you or sell your e-mail address).

Talk Back

We want to hear from you and believe that your opinion and questions are one of the most powerful tools for us to create the right tutorials for you.

Ask us questions about the 3D features, request a tutorial or tell us about the cool things you're doing with Photoshop's 3D features.

You can find us on Facebook at facebook.com/pages/Photoshop-Dimensions/374153065954372 or follow us on Twitter at twitter.com/PsDimensions or contact us directly at psd.editors@photoshopdimensions.com.

Show Us Your Best

If you have some 3D work you would like featured in our upcoming issues, please drop us a line at psd.editors@photoshopdimensions.com.

The Photoshop Dimensions Team

Pete Falco is the Lead Engineer for 3D functionality in Photoshop. He received his Masters in Engineering from Rensselaer Polytechnic Institute and has over 20 years of experience in the fields of 3D and image processing. He has been on the Photoshop team for 5 years and prior to that was an engineer on QuickTime VR, RealSpace, and Live Picture and was a co-founder of Zoomify. He is co-author of [*3D in Photoshop: the Ultimate Guide for Creative Professionals*](#).

Kevin Bomberly is the founder of several companies including Able Pear Software, Doppler Publishing and is Editor-in-Chief of *Photoshop Dimensions* and works with Adobe Systems developing Photoshop's 3D user experience. With more than 20 years in mixed and new media design, interactive system and experience design, Kevin continues to learn for himself and teach others as much as possible.

Zorana Gee, MBA, is a Senior Product Manager on the Photoshop team and has been instrumental in the feature direction of Photoshop and Photoshop Extended as well as driving the 3D efforts in Photoshop Extended and across Adobe. She is co-author of [*3D in Photoshop: the Ultimate Guide for Creative Professionals*](#) and the [*Photoshop 3D Guide*](#) iPad app. Zorana speaks extensively around the world representing Adobe and Photoshop. She can also be found flying kicks through the air while practicing the Brazilian martial art, Capoeira; she has been training and teaching Capoeira for over 12 years and holds a black-belt (equivalent).

Don McCaughey is an entrepreneur and software developer. He has worked on a wide range of projects, from embedded systems to web applications to mobile apps and with a wide range of companies, from startups to Internet giants to automobile makers. His first computer was a Radio Shack TRS-80 Model III, and he's been hooked ever since. He is the founder of mobile app developer Able Pear Software and new media company Doppler Publishing.