

"W" Blend tool "G" Gradient tool "U" Mesh tool

The speed of the blend

To control the speed of the blend, create the blend and set the number of blend steps. This creates the blend spine, which is editable just like any other Illustrator path. Using the Convert Anchor Point tool, pull out control handles from the anchor point at each end of the blend spine. By extending or shortening the control handles along the spine, the speed of the blend is controlled. —Derek Mah

Automatically updating colors

Changing a spot or global color definition (see the *Drawing & Coloring* chapter) automatically updates blends and gradients containing that color. Blends between tints of the same spot color (or a spot color and white) update when changes are made to that color, even if the blend isn't "live." (See David Cater's "Mini Cooper" Gallery in the *Advanced Techniques* chapter for a practical application of this technique.) *—ThoughtForm Design*

Blends, Gradients & Mesh

To create shading and modeling using fills and colors, it's important to learn how to work with blends, gradients, and mesh. In the history of Adobe Illustrator, blends came first, then gradients, then gradient mesh. Each can be both simple and very complex. So, we intermingle them in the lessons and galleries, even though we discuss these features, one at a time, based on the order in which they were added to Illustrator.

BLENDS

Think of blends as a way to "morph" one object's shape and/or color into another. You can create blends between multiple objects, and even gradients or compound paths such as letters. Blends are *live*, which means you can edit the key objects' shape, color, size, location, or rotation, and the resulting *in-between* objects will automatically update. You can also distribute a blend along a custom path (see details later in this chapter).

The simplest way to create a blend is to select the objects you wish to blend and choose Object > Blend > Make (\#+Option+B/Ctrl+Alt+B). The number of steps you'll have in between each object is based on either the default options for the tool, or the last settings of the Blend Options (discussed in the following section). Adjust settings for a selected blend by selecting the blend, then double-clicking the Blend tool (or via Objects > Blend > Blend Options).

Another way to create blends between individual paths is to *point map* using the Blend tool. In the past, the Blend tool was used to achieve smooth transitions between blended objects. However, now that it's been modified, it's probably best to use it for special morphing or twirling effects. To use the *point map* technique, begin by clicking on an anchor point of one object, and then on an anchor point of another object. Continue clicking on anchor points of any object you want to include in the blend. You can also click anywhere on the path of an object to achieve random blending effects.

When a blend first appears, it's selected and grouped. If you Undo immediately, the blend will be deleted, but your source objects remain selected so you can blend again. To modify a key object before or after making a blend, Direct-Select the key object first, then use any editing tool (including the Pencil, Smooth, and Path Eraser tools) to make your changes.

Blend Options

To specify Blend Options as you blend, use the Blend tool (see the *point map* directions in the previous section) and press the Option/Alt key as you click the second point. The Blend Options dialog will appear, allowing you to change any settings before making the blend. To adjust options on a completed blend, select it and double-click the Blend tool (or Object > Blend > Blend Options). Opening Blend Options without a blend selected sets the default for creating blends *in this work session*; these Options reset each time you restart the program.

- **Specified Steps** specifies the number of steps between each pair of key objects (the limit is 1000). Using fewer steps results in clearly distinguishable objects; a larger number of steps results in an almost airbrushed effect.
- **Specified Distance** places a specified distance between the objects of the blend.
- Smooth Color allows Illustrator to automatically calculate the ideal number of steps between key objects in a blend, in order to achieve the smoothest color transition. If objects are the same color, or are gradients or patterns, the calculation will equally distribute the objects within the area of the blend, based on their size.
- Orientation determines how the individual blend objects rotate as they follow the path's curves. Align to Page (the default, first icon) prevents objects from rotating as they're distributed along the path's curve (objects stay "upright" as they blend along the curve). Align to Path

To blend or not to blend...

In addition to blending between individual paths, or groups of objects, you can blend between symbols (see the Brushes & Symbols chapter for more on symbols), Live Paint objects, or between Point type objects. Some of the objects you can't include in a blend are meshes, raster images, and type objects that aren't Point type. When blending between objects containing brushes, effects, and other complex appearances, Illustrator blends affect options, which can help you create interesting animations (see the Web & Animation chapter for more on exporting animations).—Teri Petit

Efficient blending

To make a blend follow a specific path, just select a manually drawn path (with no fill or stroke) and any objects you want to blend. Once you make the blend (Object > Blend > Make), the path becomes the spine of the blended objects. — Jean-Claude Tremblay

To insert objects into a blend

Group-Select a key object and Option/Alt-drag to insert a new key object (the blend will reflow). You can also insert new objects by entering Isolation mode (see previous chapter) or by dragging them into the blend in the Layers panel.



The ripening tomatoes on a vine, above, was created using a variety of blends: the smooth color option for the vine, and groups of objects blended into each other with Specified Steps and a custom **S** curve "spine" (see Aaron Mc-Garry's explanation on the Wow! CD).

Reverse Front to Back

To reverse the order of a blend with only two key objects, Direct-Select one of the key objects and choose Object > Arrange, or for any blend choose Object > Blend > Reverse Front to Back. You can also reorder the objects by expanding the Blend in the Layers panel and dragging the <path> to a new location within the Blend. (the second icon).allows blend objects to rotate as they follow the path.

Blends along a path

There are two ways to make blends follow a curved path. The first way is to Direct-Select the *spine* of a blend (the path automatically created by the blend) and then use the Add/Delete Anchor Point tools, or any of the following tools, to curve or edit the path: the Direct Selection, Lasso, Convert Anchor Point, Pencil, Smooth, or even the Path Eraser tool. As you edit the spine of the blend, Illustrator automatically redraws the blend objects to align to the edited spine.

Secondly, you can also replace the spine with a customized path: Select both the customized path and the blend, and choose Object > Blend > Replace Spine. This command moves the blend to its new spine.

You can also blend between pairs of grouped objects. If you're not getting the results you expect, try creating your first set of objects and grouping them (\mathcal{B} -G/Ctrl-G). Now copy and paste a duplicate set (or Option/Alt and drag to create a copy of your group). Select the two sets of grouped objects and blend choosing Specified Steps as the blend option. Once the objects are blended, you can rotate and scale them, and use the Direct Selection tool to edit the objects or the spine. (To experiment with a pair of grouped blends in this way, find the figures at left on the *Wow! CD* as "AaronMcGarry-blends.ai.")

Reversing, releasing, and expanding blends

Once you've created and selected a blend, you can do any of the following:

- **Reverse** the order of objects on the spine by choosing Object > Blend > Reverse Spine.
- **Release** blends (Object > Blend > Release) removes blends, leaving key objects and spines. *Hint: Select*>*Select All releases multiple blends simultaneously.*
- **Expand** a blend to turn it into a group of separate, editable objects. Choose Object > Blend > Expand.

GRADIENTS

Gradients are color fills that seamlessly transition from one color into another. Adobe has made some great enhancements to gradients, allowing you to work faster and more efficiently. Before Illustrator CS4, all gradient adjustments had to made within the Gradient panel. Now these adjustments can be made on the artboard, directly on the gradient itself. When you select an object with a gradient and select the Gradient tool, a white bar appears across the gradient on the artboard. This bar is called the Gradient Annotator (if this bar doesn't appear you may need to turn it on by choosing View>Show Gradient Annotator [\$G-Option-G/Ctrl-Alt-G]). Later in this section we'll discuss other gradient features such as the Reverse Gradient toggle, Aspect Ratio control, and even the ability to reduce the opacity of color stops.

To open the Gradient panel, double-click the Gradient tool icon on the Toolbox, or choose Window > Gradient. Gradients can be linear or radial (circular from the center). If you intend to go back and forth between gradient and solid color fills, float your Gradient panel by grabbing its tab and dragging it away from the docking area. This allows you to have your Swatches and Gradient panel open at the same time. Once your Gradient panel is floating, you can adjust its size vertically or horizontally by grabbing the end or side of the panel (your cursor becomes a 2-way arrow when on the edge). Hovering your cursor over the panel top and clicking collapses your panel to an icon; toggling the arrow icon next to "Gradient" in the tab reduces or expands the panel options.

To apply a gradient to an object, select the object and click on a gradient swatch in the Swatches panel, or click on the object with the Gradient tool to fill with the lastused (or default) gradient or double-click the Gradient tool (to open the Gradient panel), and click on either the the gradient slider or swatch.

To start adjusting a gradient, first select the gradient object, then click on the Gradient tool in the Tool panel, which reveals a white annotator bar across your gradient.

How long can a gradient be?

Click and drag with the Gradient tool anywhere in your image window; you don't need to stay within the objects themselves.

Adding color to your gradient

- Double-click the color stop on the Gradient Annotator bar, or slider bar in the Gradient panel, and select a color from the Swatches or Color panel.
- Drag a swatch from the Color or Swatches panel to the gradient slider until you see a vertical line indicating where the new color stop will be added.
- If the Fill is a solid color, you can drag color from the Fill icon at the bottom of the Toolbox.
- Hold down the Option/Alt key to drag a copy of a color stop.
- Option/Alt-drag one stop over another to *swap* their colors.
- Click just beneath the Gradient annotator bar or slider of a gradient where the stops are to add a new stop (a small "+" sign appears next to your cursor when you are in the correct location for adding a new stop).

Making a new gradient

Start by selecting an existing gradient from the Swatches panel similar to the one you wish to create and then proceed with the instructions shown in this chapter for adjusting and customizing it.



For the flame in his candle illustration, Aaron McGarry created a custom radial gradient



The Gradient panel for the candle flame above; the color stops with adjusted opacities are indicated by the additional rectangle below the stop. The opacity of the second color stop from the left is indicated in the field below the slider.



A detail of the candle flame above showing the gradient annotator on the flame with color stops; the flame has an aspect ratio of 40%, an angle of 80° and various opacity settings for each color stop so that the wick is partially visible through portions of the flame

Missing Gradient Annotator?

Don't see the Gradient Annotator? Try View>Show Gradient Annotator (%-Option-G/Ctrl-Alt-G). However, if one gradient is applied to multiple objects, the annotator won't reliably appear. As you move your cursor over the annotator it changes to a gradient slider, complete with color stops. You can customize your own gradients by adding and/or adjusting the stops (pointers representing colors) along the lower edge of the annotator; adjust the midpoint between the color stops by sliding the diamond shapes along the top of the annotator (these adjustments can also be made on the gradient slider within the Gradient panel).

Using the gradient Annotator, you'll be able to make many adjustments with precision on your actual illustration. Grab and drag a diamond endpoint to resize or rotate your gradient. With a radial gradient, when you move your cursor over the gradient, the gradient circumference appears as a dashed line, with a double-walled circle on the dashed line to the left allows you to resize your gradient while the circle with the black center at the top allows you to change the aspect ratio. Use the aspect ratio to change the shape of your radial gradient by making it elliptical or for adding perspective. Drag the last circle at the end of the annotator if you wish to reposition the center point of your radial gradient (the smaller most outer circle of the two at the end of the annotator bar).

When you double-click on a stop on the annotator (or gradient slider) the Swatches panel appears. The two icons on the left side of this panel allow you to toggle between the Swatches or Color panel. Color opacity of that selected stop is also adjustable from this panel. When an opacity less than 100% is applied to a stop, it's indicated by a small rectangle that hangs from the stop (see stops on slider in panel image to the left). This feature can be useful for revealing underlying objects.

You'll notice that the Gradient panel also accommodates the features found on the gradient annotator plus some additional ones. The Gradient fill pop-up menu (next to the sample swatch) in the top left corner of the panel allows you to choose from or save to a library of gradients. Below the swatch is the "Reverse Gradient" toggle, which allows you to reverse your gradient (and back again) with a single click. The fields below the gradient Type pop-up are the numerical controls for angle and aspect ratio. As with the gradient annotator, you can double-click a stop to access the Swatches or Color panel. With a stop selected, you can adjust the opacity by entering a new number into the Opacity field, or adjust the slider from the pop-up arrow. Below the Opacity field is the "Location" field where you can see, and modify, the precise location of a selected stop in relation to the beginning of a gradient. The fields in the Gradient panel also provide a numeric level of accuracy for your gradient so you can enter a number directly into the field instead of using the field slider.

You can apply a gradient to multiple selected objects across a unified blend by clicking and dragging with the Gradient tool (see lessons in this chapter for detailed examples of how to use the gradient tool). To create the illusion of a gradient within a stroke, convert the stroke to a filled object (Object > Path > Outline Stroke). You can use this method to create a "trap" for gradients.

To turn a gradient into a grouped, masked blend, use Object >Expand (see the *Advanced Techniques* chapter for more on masks and masked blends).

The Swatch Libraries menu icon at the bottom left of the Swatches panel allows you to access additional pre-made gradients (also accessible by choosing Window>Swatch Libraries>Gradients). Use the Show Swatch Kinds menu icon next to it to show only gradient swatches.

There are several ways of saving a new gradient. One way is by clicking the "new swatch" icon at the bottom of the Swatches panel (make sure your gradient is selected); this will prompt you to name your new gradient. You can also drag and drop the gradient preview from the Gradient panel to the Swatches panel or to save a gradient from within the Gradient panel. Do so by choosing the disk icon from the bottom of the Gradient Fill swatch's popup menu. This save icon is only active for new gradients. **Note:** Aspect ratio and angle information are not saved with gradient swatches.

Reset gradients to defaults

After you select an object that has an altered gradient angle (or highlight), new objects you draw will have the same settings. The simplest way to "re-zero" gradient settings such as angles is to have both the Swatches and Gradient panels open, and, with your selected gradient, select a solid color fill from the Swatches panel and then click on the slider in the Gradient panel. For linear gradients, you can type a zero in the Angle field. Or, you can use the Gradient panel to switch between the Radial type and Linear type and then back again to reset a custom angle without removing or relocating color stops.

Gradient or Blend?

Gradients and Blends are often confused due to the similar results both can produce, namely with color transitions. However, they are very different in nature.

- Gradients can only be used as fills for paths.
- Gradients are either linear or radial moving in parallel from one side to another, or from a center point to the outside.
- Blends are morphed paths between two end paths and so, in addition to blending colors, can also morph shapes. Blends are not restricted to the directional confines of Gradients.



The amazing photorealistic work with mesh only starts in this chapter—don't miss the additional mesh artwork in the Advanced Techniques chapter—above is a detail of an illustration by Ann Paidrick.

Adding rows and columns

To add new rows and columns to your mesh, click on the mesh object with the Mesh tool (U). To add a new mesh row, click on a column mesh line. To add a new mesh column, click on a row.

Adding color to the mesh

When adding a new mesh point, the color currently selected in the Swatches panel will be applied to the new point. If you want the new mesh point to remain the color currently applied to the mesh object, hold the Shift key while adding a new point.

Moving rows and columns

When moving a mesh point, both the row and column mesh lines intersecting that point will move with it. To move a row or column mesh line independently, without moving the other, hold the Shift key while you drag a line. If you drag up or down, only the row line moves; if you drag left or right, only the column line moves.

GRADIENT MESH

In this book you'll find many amazing photorealistic images created using gradient mesh. A *mesh object* is an object on which multiple colors can flow in different directions, with smooth transitions between specially defined *mesh points*. You can transform a solid or gradient-filled object into mesh (you can't transform compound paths into mesh). Once transformed, the object will always be a mesh object, so be certain that you work with a copy of the original if it's difficult to re-create.

Transform solid filled objects into gradient mesh objects either by choosing Object > Create Gradient Mesh (so you can specify details on the mesh construction) or by clicking on the object with the Mesh tool.

One way to get a head start in creating a mesh object, is to transform an object filled with a gradient, into a mesh object. To transform a gradient-filled object, select Object>Expand and enable the Gradient Mesh option.

Use the Mesh tool to add lines and points to the mesh. Select individual points, or groups of points, within the mesh using the Direct Selection tool, the Lasso tool, or the Mesh tool in order to move, color, or delete them. For details on working with gradient meshes (including the Warning Tip about printing mesh objects), see Galleries and lessons later in this chapter, as well as the *Advanced Techniques* chapter. *Hint: Instead of applying a mesh to a complex path, try to first create the mesh from a simpler path outline, then mask the mesh with the more complex path.*

Get back your (mesh) shape!

When you convert a path to a mesh, it's no longer a path, but a mesh object. To extract an editable path from a mesh, select the mesh object, choose Object > Path > Offset Path, enter 0, and press OK. If there are too many points in your new path, try using Object > Path > Simplify (for more on Simplify see the *Drawing & Coloring* intro). —*Pierre Louveaux*