How to draw in Illustrator

You can easily draw and modify vector graphics and shapes by using a set of drawing tools and techniques in Adobe Illustrator. *Vector* paths (sometimes called vector shapes or vector objects) are made up of lines and curves defined by mathematical objects called vectors, which describe an image according to its geometric characteristics. You can freely move or modify vector graphics without losing detail or clarity because they are resolution-independent—they maintain crisp edges when resized, printed to a PostScript printer, saved in a PDF file, or imported into a vector-based graphics application. As a result, vector graphics are the best choice for artwork, such as logos, that will be used at various sizes and in various output media (**Figure 1**).
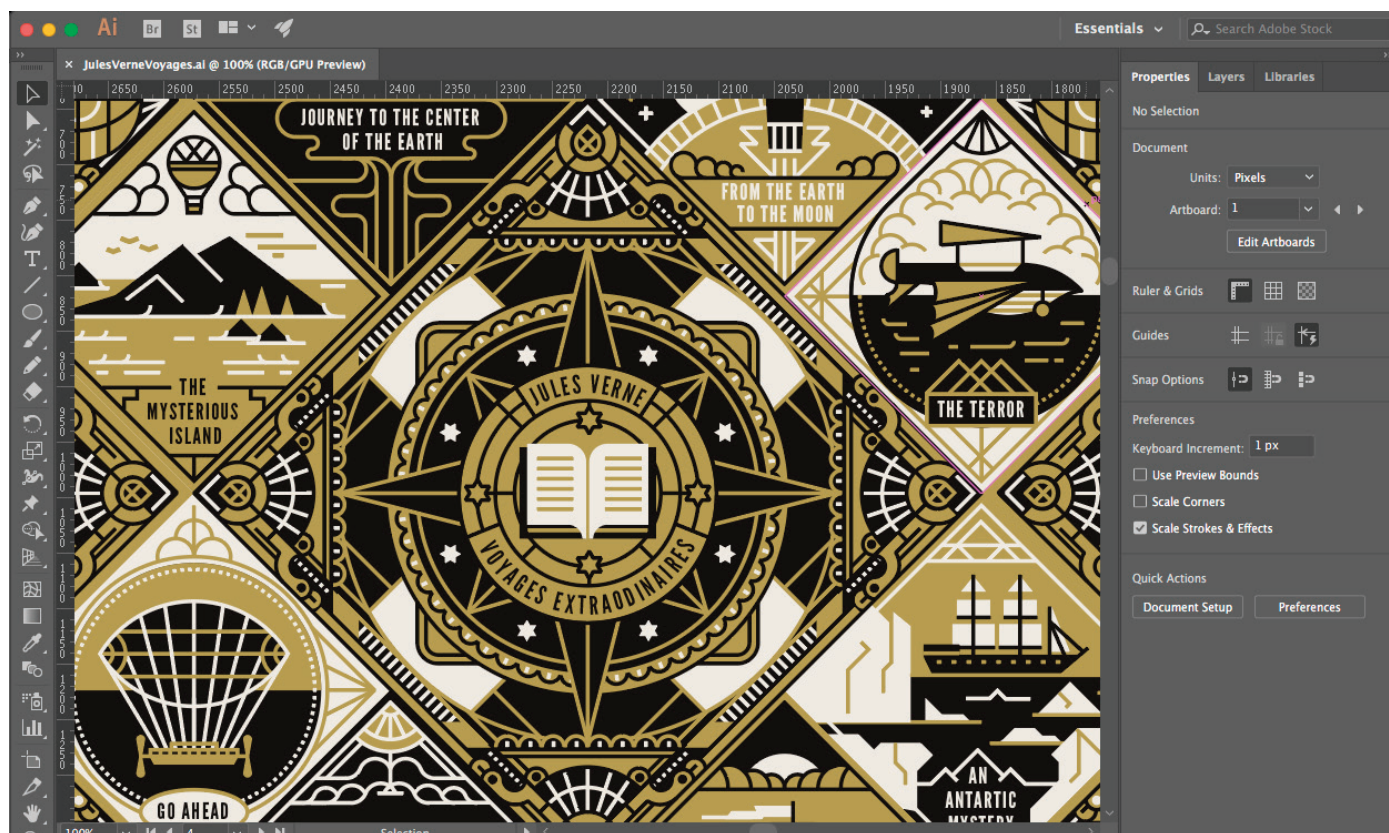

Figure 1 An example of vector-based artwork produced in Adobe Illustrator

As you draw in Illustrator, the mathematical formulas create paths. Paths are lines that connect one point to another. Almost everything you draw in Illustrator is made up of paths. Because these paths are made up of connection points, you can easily adjust the points to change the shape of the path.

Adobe Illustrator is a powerful and professional-level vector graphics editor where the tasks and options for drawing are numerous. This guide serves as an introduction to Illustrator drawing tools and covers the following:

- Drawing with the Pencil tool
- How to work with brushes
- Drawing with the Pen tool
- Drawing with the Blob Brush tool
- Drawing shapes with the Shape tool and the Shape Builder tool

After you complete this guide, be sure to continue exploring the full breadth of drawing and shape tools available in Illustrator by checking out the Help section of the Adobe website.

Drawing with the Pencil tool

You can use the Pencil tool to draw open and closed paths as if you were drawing with a pencil on paper. It is most useful for fast sketching or creating a hand-drawn look. Once you draw a path, you can immediately change it if needed.

Anchor points are set down as you draw with the Pencil tool; you do not determine where they are positioned. However, you can adjust them once the path is complete. The number of anchor points set down is determined by the length and complexity of the path and by tolerance settings in the Pencil Tool Preferences dialog box. These settings control how sensitive the Pencil tool is to the movement of your mouse or graphics-tablet stylus.

When you use a drawing tool (in this case, the Pencil tool), the Properties panel displays options for the currently selected tool (**Figure 2**).

- *Tool Options* button displays options for the Pencil tool, including a slider for line Fidelity. You can choose whether you want the path to be accurate to the drawing action or smoothed into curves.
- *Transform* Displays information about the location, size, and orientation of one or more selected objects.
- *Appearance settings:*
  - *Fill color* The interior color of a shape. Select from a series of swatches.
  - *Stroke color* The outline of a shape. Select from a series of swatches.
  - *Stroke weight* Weight for the stroke, in points.
  - *Opacity* Transparency for painted lines, from 0% (invisible) to 100% (opaque).
- *Quick Actions* Includes options for adjusting offsetting a path from its source line, recoloring a path, joining ends, and arranging objects on a canvas.
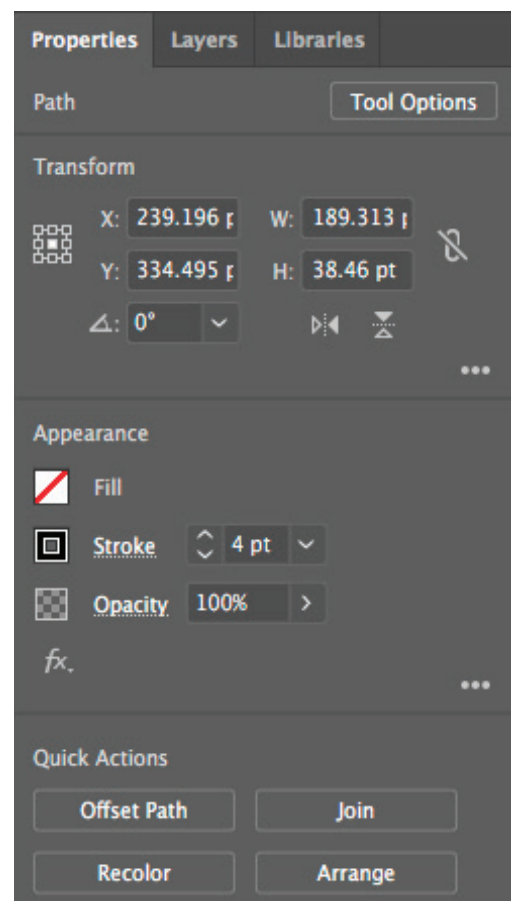

Figure 2 Properties panel

In this section, you'll learn about creating freeform paths with the Pencil tool, using the three drawing modes to layer paths and objects, and modifying a stroke by using the Path Control panel.

To draw a freeform path with the Pencil tool:

1. Select the **Pencil Tool** in the Tools panel (**Figure 3**).

2. Set the stroke color and thickness in the Properties panel (**Figure 2**).

3. Position the tool where you want the path to begin, and drag to draw a path.

   The Pencil tool displays a small asterisk to indicate you are drawing a freeform path (**Figure 4**).

   As you drag, you create a line with connection points. You can drag these points later to change the shape of the line.

4. Release the mouse button to create the line (**Figure 5**).

5. To adjust line fidelity, click the **Tool Options** button at the top of the **Properties** panel.

   In the **Pencil Tool Options** dialog box, adjust the **Fidelty** slider all the way left to **Accurate** and draw a line. Adjust slider all the way to the right to Smooth and draw another line. Compare the results (**Figure 6**).
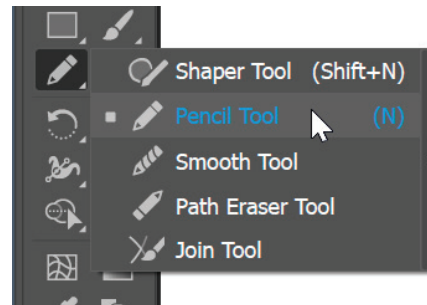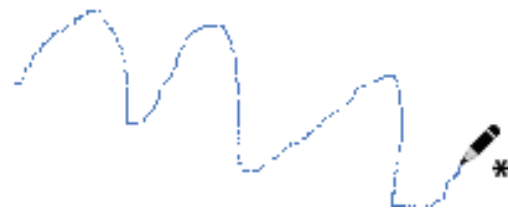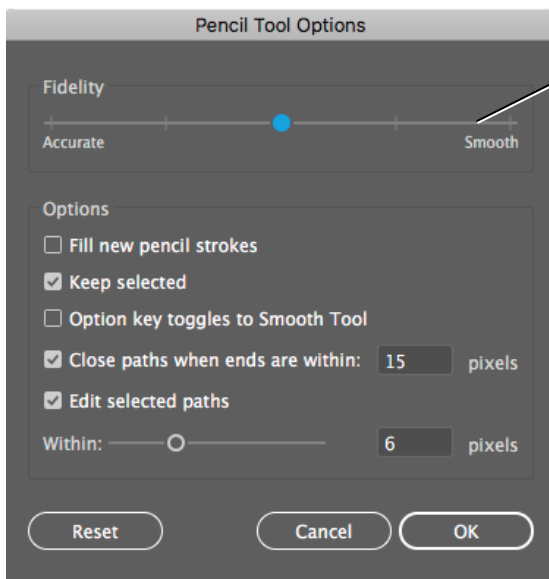

Figure 3 Tools panel

Figure 4 Drawing a line with Pencil tool

Figure 5 Line drawn with Pencil tool

Figure 6 Pencil tool Fidelity settings, Accurate (top right) and Smooth (bottom right)

Using drawing modes

Illustrator provides the following drawing modes: Draw Normal, Draw Behind, and Draw Inside. You can select drawing modes from the Tools panel, below the Color Selector tool (**Figure 7**).
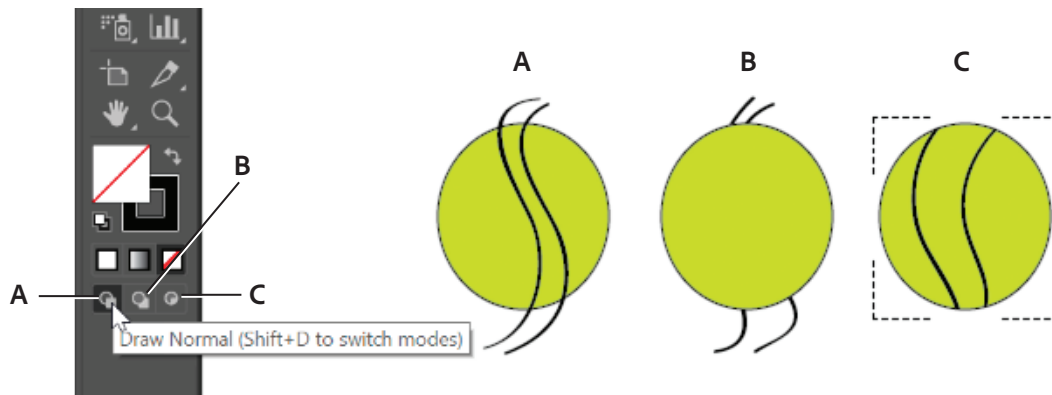

Figure 7 *Draw Normal (A), Draw Behind (B), and Draw Inside (C)*

- *Draw Normal* mode is the default drawing mode and allows you to draw on top of other paths and objects.
- *Draw Behind* mode allows you to draw behind all artwork on a selected layer if no artwork is selected. If an artwork is selected, the new object is drawn directly beneath the selected object.
- *Draw Inside* mode allows you to draw inside the selected object. The Draw Inside mode eliminates the need to perform multiple tasks such as drawing and altering stacking order or drawing, selecting, and creating a clipping mask. The Draw Inside mode is enabled only when there is a single selected object (path, compound path, or text).

How to use drawing modes:

1. To switch drawing modes, select the Draw Behind drawing mode (**Figure 7**).

2. Select the Pencil tool in the Tools panel.

3. Set a different stroke color and thickness in the **Properties** panel from the previous steps.

4. Position the tool where you want the path to begin, and drag to draw a path that overlaps the strokes.

   Observe how the line is drawn on a layer beneath the original layer (**Figure 8**).

Figure 8 *Draw Behind mode*

5. Select a shape tool from the Tools panel, for example, the Ellipse tool.

6. Draw a shape on the canvas and set the stroke and fill properties in the **Properties** panel.

7. Choose the Selection tool in the Tools panel and select the shape.

   The Draw Inside mode is enabled only when there is a single selected object (path, compound path, or text).

8. Click the Draw Inside drawing mode.

   A dotted bounding box appears around the selected shape (**Figure 9**)

9. Select the Pencil tool in the Tools panel.

10. Set a different stroke color and thickness in the **Properties** panel.

11. Drag to draw a path that overlaps the object and extends beyond its boundaries (**Figure 10**).

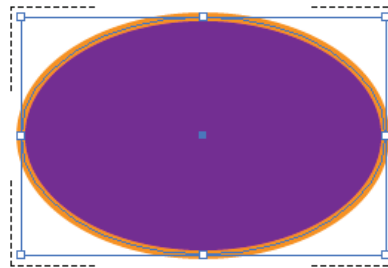   Observe how the finished line appears only inside the original shape (**Figure 11**).
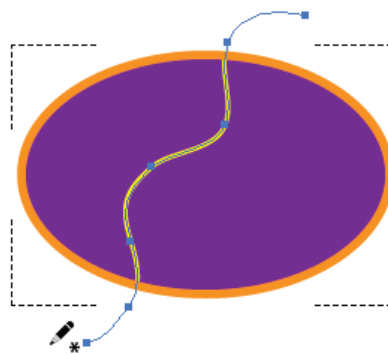

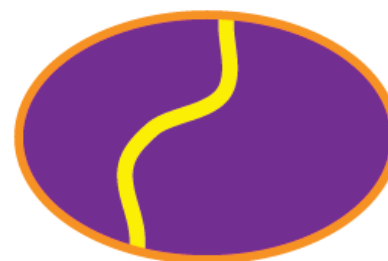*Figure 9 Draw Inside bounding box*

Figure 10 Draw a path

Figure 11 Finished line inside shape

Modifying a stroke

Strokes (lines and outlines) and brushes are essential elements of most artwork created with Illustrator. You can modify a stroke to create beautiful and visually expressive lines. Easily adjust the width of strokes by applying a variable-width preset. You can also add a gradient to a stroke along its length or width, with complete control over gradient placement and opacity.

To create a stroke with a variable width:

1. Choose the Selection tool in the Tools panel.

2. Select the stroke you want to modify (**Figure 12**).
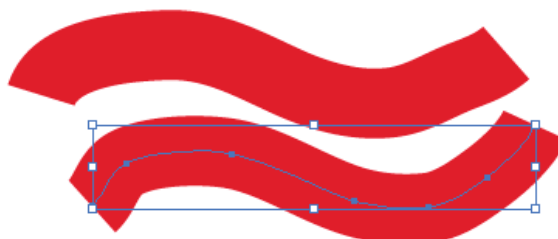

Figure 12 Selecting a stroke

3. Select **Window** > **Stroke** to open the **Stroke** panel.

4. Choose a stroke profile from the **Profile** menu in the **Stroke** panel (**Figure 13**).

   The new stroke profile is applied (**Figure 14**). Increasing the weight of the stroke generally makes the variation in width more pronounced.

   Note: You can also modify the width of a stroke and save it as a custom profile by using the Width tool. See Illustrator Help for more information.

5. With the stroke still selected, click the **Stroke** color button in the **Properties** panel.

   The Color Picker opens (**Figure 15**).

   Note: Holding down the Shift key while clicking brings up an alternate color UI where you can specify exact CMYK values.

6. Select a gradient option to apply.

   For example, in **Figure 16**, a multi-colored green, yellow, and orange stroke gradient is applied to the stroke.

   Note: You can easily modify the stroke gradient type, gradient angle, colors, and opacities by using the **Gradient** panel.
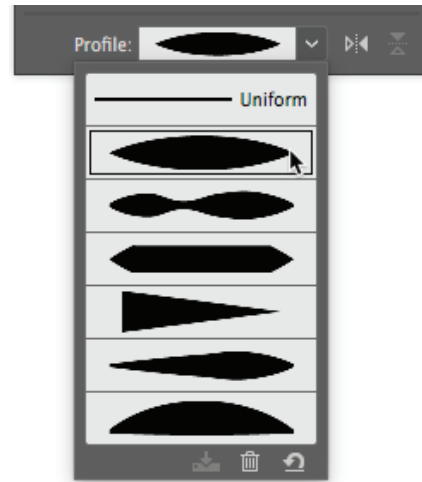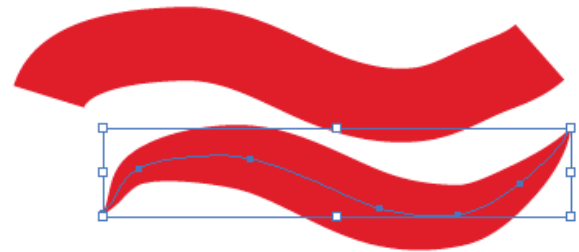

Figure 13 Variable Width Profile options
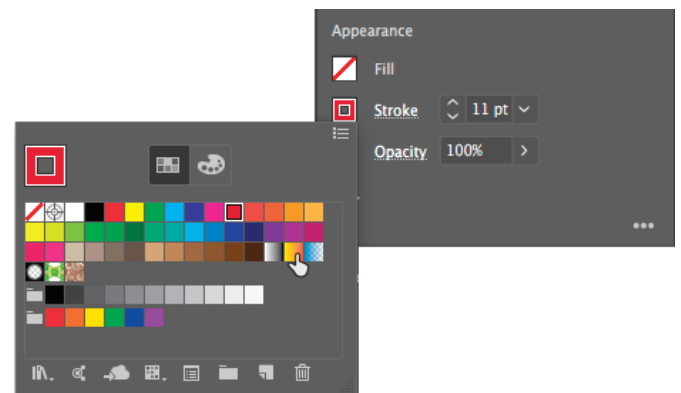

Figure 14 Variable Width Profile applied
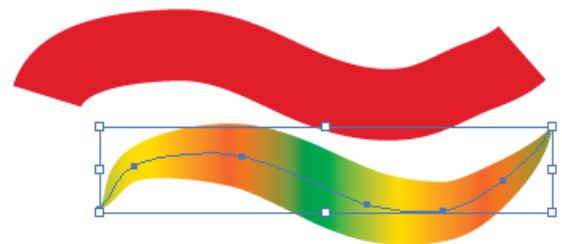

Figure 15 Color Picker

Figure 16 Stroke gradient applied

Drawing with the Pen tool

As you draw with the Pen tool, you create a line called a path. A path is made up of one or more straight or curved segments (**Figure 17**). The beginning and end of each segment are marked by anchor points, which work like pins holding a wire in place. A path can be closed (a circle), or open, with distinct endpoints (a wavy line).
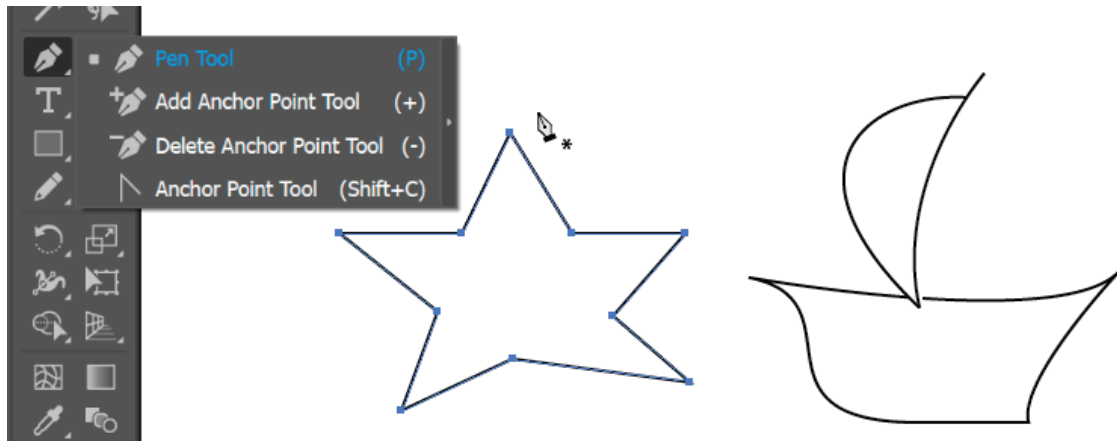

Figure 17 Pen tool with straight lines (left) and curved lines (right)

Adding anchor points can give you more control over a path, or it can extend an open path. However, it's a good idea not to add more points than necessary. A path with fewer points is easier to edit, display, and print. You can reduce the complexity of a path by deleting unnecessary points. Adding and deleting anchor points works similarly across Adobe applications. The Tools panel contains three tools for adding or deleting points: the Pen tool, the Add Anchor Point tool, and the Delete Anchor Point tool. In addition, the Control panel has a Remove Selected Anchor Points button.

The simplest path you can draw with the Pen tool is a straight line, made by clicking the Pen tool to create two anchor points. By continuing to click, you create a path made of straight-line segments connected by corner points.

You create a curve by adding an anchor point where a curve changes direction, and dragging the direction lines that shape the curve. The length and slope of the direction lines determine the shape of the curve. Curves are easier to edit and your system can display and print them faster if you draw them using as few anchor points as possible. Using too many points can also introduce unwanted bumps in a curve. Instead, draw widely spaced anchor points, and practice shaping curves by adjusting the length and angles of the direction lines.

When you select an anchor point that connects curved segments (or select the segment itself), the anchor points of the connecting segments display direction handles—direction lines that end in direction points. The angle and length of the direction lines determine the shape and size of the curved segments. Moving the direction points reshapes the curves. Direction lines don't appear in the final output.

In this section, you'll use the Pen tool to draw both straight and curved lines.

How to draw straight-line segments with the Pen tool:

1. Select the **Pen Tool** from the Tools panel (**Figure 18**).

2. Position the Pen tool where you want the straight segment to begin, and click to define the first anchor point (do not drag).
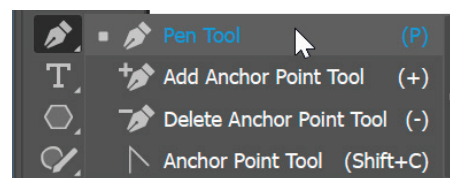

Figure 18 Tools panel

Note: The first segment you draw will not be visible until you click a second anchor point. Also, if direction lines appear, you've accidentally dragged the Pen tool; choose **Edit** > **Undo**, and click again.

3. Click again where you want the segment to end (**Figure 19**).

4. Continue clicking to set anchor points for additional straight segments.

   The last anchor point you add always appears as a solid square, indicating that it is selected. Previously defined anchor points become hollow, and deselected, as you add more anchor points.

5. Complete the path by doing one of the following:

   • To close the path, position the Pen tool over the first (hollow) anchor point. A small circle appears next to the Pen tool pointer when it is positioned correctly (**Figure 20**). Click or drag to close the path.

   Note: To close a path, you can also select the object and choose **Object** > **Paths** > **Close Path**.

   • To leave the path open, **Ctrl-click** (Windows) or **Command-click** (Mac OS) anywhere away from all objects.

   To leave the path open, you can also select a different tool, or choose **Select** > **Deselect**. You can also simply press **Enter** or **Return** to leave the path open.

6. You can reposition anchor points by choosing the Direct Selection tool from the toolbar and dragging to reposition the anchor point (**Figure 21**).

7. To add or delete anchor points, select the path you want to modify and:

   • To add an anchor point, select the Pen tool or the Add Anchor Point tool, position the pointer over the path segment, and click.

   • To delete an anchor point, select the Pen tool or the Delete Anchor Point tool, position the pointer over the anchor point, and click (**Figure 22**).

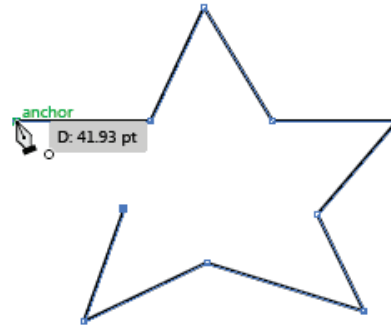*Figure 19* Click to create straight lines
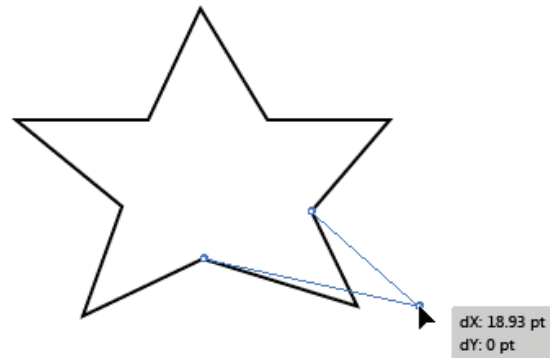

Figure 20 Pen tool with circle icon

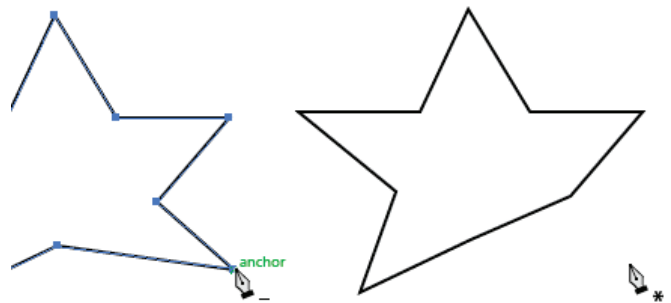*Figure 21* Drag anchor point to reposition

Figure 22 Click an anchor point to delete

How to draw curves with the Pen tool:

1. Select the Pen tool from the Tools panel.

2. Position the Pen tool where you want the curve to begin, and hold down the mouse button.

   The first anchor point appears, and the Pen tool pointer changes to an arrowhead.

3. Drag to set the slope of the curve segment you're creating (**Figure 23**), then release the mouse button.

   You can extend the direction line about one-third of the distance to the next anchor point you plan to draw. (You can adjust one or both sides of the line later.)

4. Position the Pen tool where you want the curve segment to end, and do one of the following:

   - To create a C-shaped curve, drag in a direction opposite to the previous direction line. Then release the mouse button.

   - To create an S-shaped curve, drag in the same direction as the previous direction line (**Figure 24**). Then release the mouse button.

5. Continue dragging the Pen tool from different locations to create a series of smooth curves.

   Note: You are placing anchor points at the beginning and end of each curve, not at the tip of the curve.

6. Complete the path by doing one of the following:

   - To close the path, position the Pen tool over the first (hollow) anchor point. A small circle appears next to the Pen tool pointer when it is positioned correctly (**Figure 25**). Click or drag to close the path.

   Note: To close a path, select the object and choose **Object** > **Paths** > **Close Path.**

   - To leave the path open, **Ctrl-click** (Windows) or **Command-click** (Mac OS) anywhere away from all objects.

   - To leave the path open, you can also select a different tool, or choose **Select** > **Deselect**.

7. You can reposition anchor points by choosing the Direct Selection tool from the toolbar and drag to reposition.

8. To add or delete anchor points, select the path you want to modify and:

   - To add an anchor point, select the Pen tool or the Add Anchor Point tool, position the pointer over the path segment, and click.

   - To delete an anchor point, select the Pen tool or the Delete Anchor Point tool, position the pointer over the anchor point, and click.

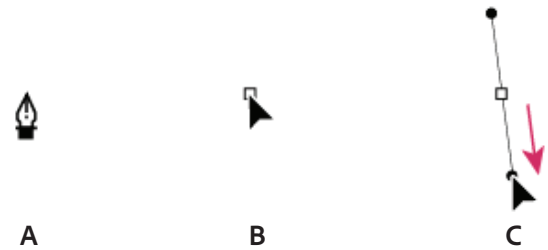

A   **B**   **C**

Figure 23 Drawing the first point in a curve: A. Positioning Pen tool B. Starting to drag (mouse button pressed) C. Dragging to extend direction lines
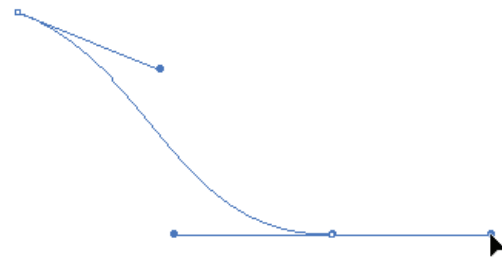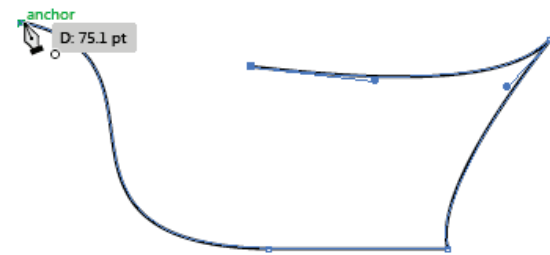

Figure 24 Drawing an S curve

Figure 25 Start top of column

You can use brushes to stylize the appearance of paths. You can apply brush strokes to existing paths, or you can use the Paintbrush tool to draw a path and apply a brush stroke simultaneously.

You can achieve a variety of effects with several types of brushes available in Illustrator (**Figure 26**):

- *Calligraphic brushes* Create strokes that resemble those drawn with the angled point of a calligraphy pen and along the center of the path. When you use the Blob Brush tool, you can paint with a calligraphic brush and automatically expand the brush stroke into a fill shape. This shape can merge with other filled objects of the same color that intersect or are adjacent in stacking order.

- *Scatter brushes* Disperse copies of an object (such as a ladybug or a leaf) along the path.

- *Art brushes* Stretch a brush shape (such as Rough Charcoal) evenly along the length of a path.

- *Bristle brush* Create brush strokes with the appearance of a natural brush with bristles.

- *Pattern brushes* Paint a pattern—made of individual tiles—that repeats along the path. Pattern brushes can include up to five tiles, for the sides, inner corner, outer corner, beginning, and end of the pattern.
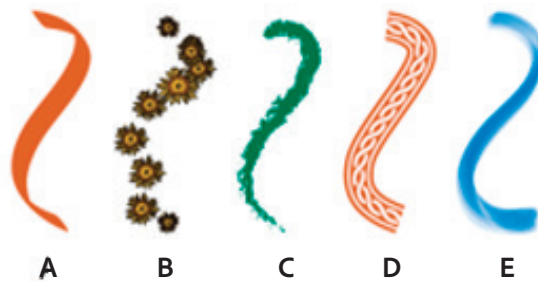

Figure 26 Types of brushes: A. Calligraphic Brush; B. Scatter Brush; C. Art Brush; D. Pattern Brush; E. Bristle Brush

Scatter brushes and Pattern brushes can often achieve the same effect. However, one way in which they differ is that Pattern brushes follow the path exactly to create precise, clean, and neat brush strokes, where Scatter brushes tend to create messier, scattered, more expressive brush strokes (**Figure 27**).
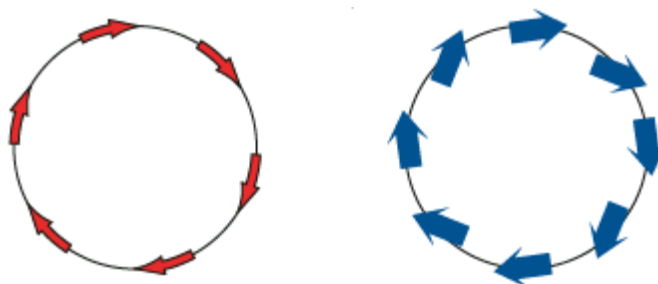

Figure 27 Pattern brush on a path (left) and Scatter brushes on a path (right)

The Brushes panel displays brushes for the current file (**Figure 28**). Whenever you select a brush in a brush library, it is automatically added to the Brushes panel. Brushes you create and store in the Brushes panel are associated only with the current file, which means each Illustrator file can have a different set of brushes in its Brushes panel. For example, the Bristle Brush Library features brush tips that give the appearance of brush strokes along a path.
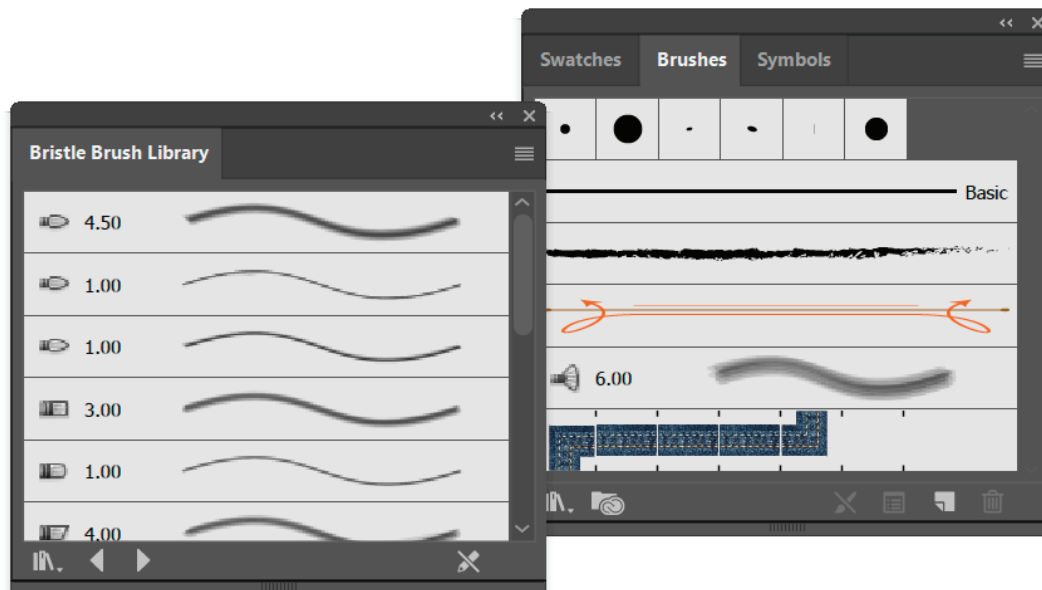

Figure 28 Bristle Brush Library (left) and Brushes panel (right)

In this section, you'll learn how to use brushes and brush libraries, and how to paint with a brush made from a photo.

How to show/hide, change views or order of brushes, duplicate or delete brushes:

To show or hide a type of brush, choose any of the following from the panel menu (**Figure 29**):

- **Show Calligraphic Brushes**
- **Show Scatter Brushes**
- **Show Art Brushes**
- **Show Bristle Brushes**
- **Show Pattern Brushes**

To change the view of brushes, choose Thumbnail View or **List View** from the panel menu.
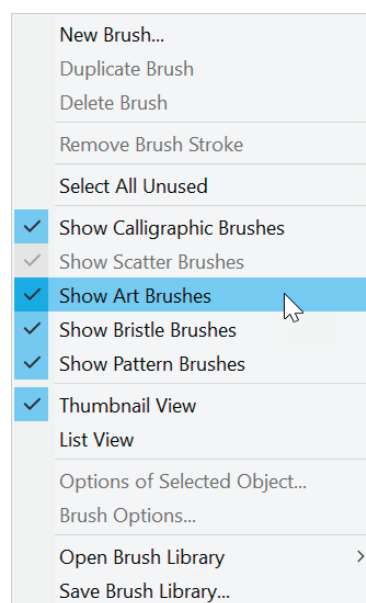

Figure 29 Detail of Brushes panel menu

To change the order of brushes in the Brushes panel, drag a brush to a new location (**Figure 30**). You can move brushes only within their type. For example, you cannot move a Calligraphic brush to the Scatter brush area.

To duplicate a brush in the Brushes panel, drag the brush onto the New Brush button or choose Duplicate Brush from the Brushes panel menu.

To delete a brush from the Brushes panel, select the brush and click the Delete Brush button. You can select brushes that aren't used in a document by choosing Select All Unused from the Brushes panel menu.
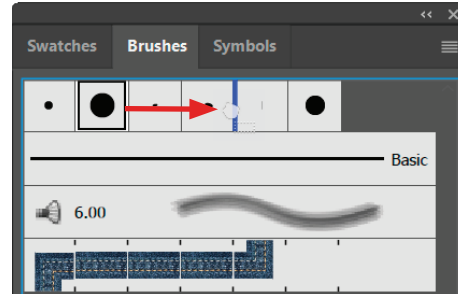
Figure 30 Drag brush to a new location

To draw with the Paintbrush tool:

1. Select the Paintbrush tool in the Tools panel (**Figure 31**).

2. Choose a stroke color in the **Properties** panel.

3. Choose **Window** > **Brushes** to display the Brushes panel.

4. From the Brushes panel menu, choose **Open Brush Library** > **Bristle Brush** > **Bristle Brush Library** (**Figure 28**).

5. Click any brush from the **Bristle Brushes Library** to add it to the Brushes panel.

6. Return to the **Brushes** panel.

7. You can specify different options for the different types of brushes. To change the options for a brush, double-click the brush in the Brushes panel.

    The **Bristle Brush Options** dialog box opens (**Figure 32**).

8. Modify any of the brush characteristics or click **OK** to close the dialog box.

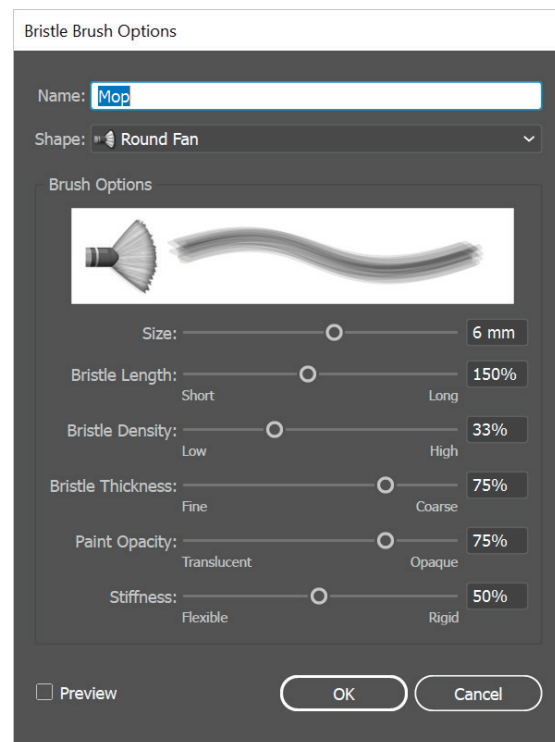9. Set the stroke color, weight, and other options in the **Properties** panel.

Figure 31 Tools panel

Figure 32 Bristle Brush Options dialog box

10. Draw freehand by dragging in the image (**Figure 33**).

11. Release the mouse button to complete the path (**Figure 34**).

    When you are using the Paintbrush tool, the line's edges have a much softer edge than they do with the Pencil tool.
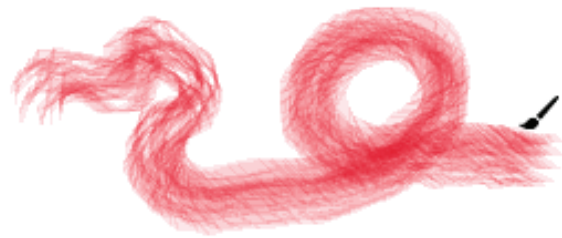

Figure 33 Drawing with the Paintbrush tool

Figure 34 Completed Paintbrush tool path

Work with brush libraries

Brush libraries are collections of preset brushes that come with Illustrator. You can open multiple brush libraries to browse through their contents and select brushes (**Figure 35**).
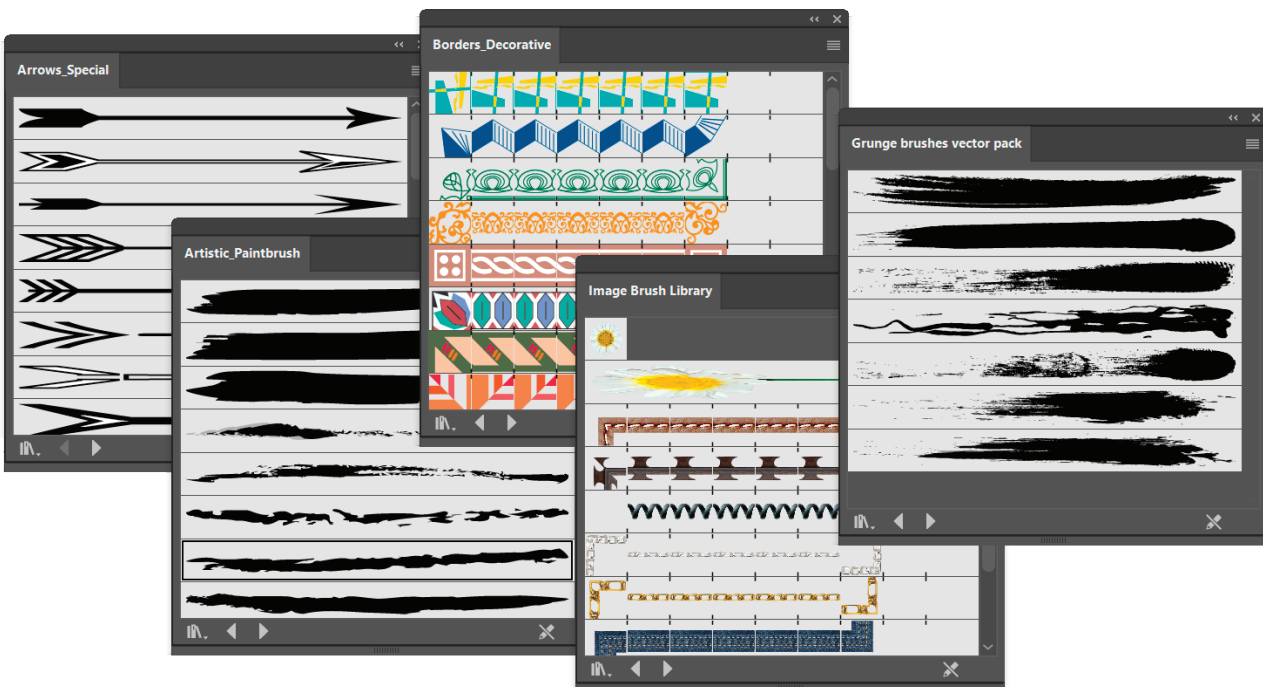
Figure 35 A selection of brush libraries

How to copy brushes from a brush library to the Brushes panel:

1. Open a brush library by using the **Brushes** panel menu (**Figure 36**).

   You can also open brush libraries by choosing **Window** > **Brush Libraries** > [**library**].

2. Drag the brushes to the **Brushes** panel (**Figure 37**) or choose **Add To Brushes** from the brush library's panel menu.
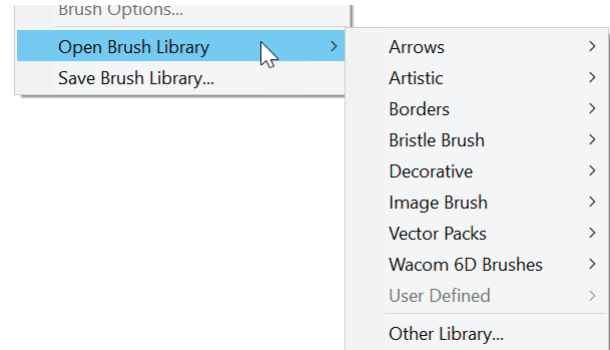

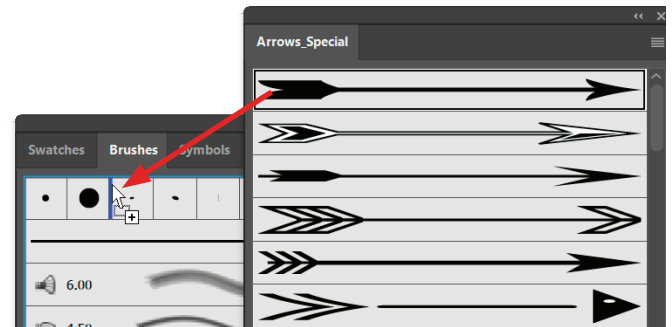*Figure 36 Detail of Brushes panel menu*

Figure 37 Drag to add to Brushes panel

How to create new brush libraries:

1. Add the brushes you want to the **Brushes** panel, and delete any brushes you don't want (**Figure 38**).
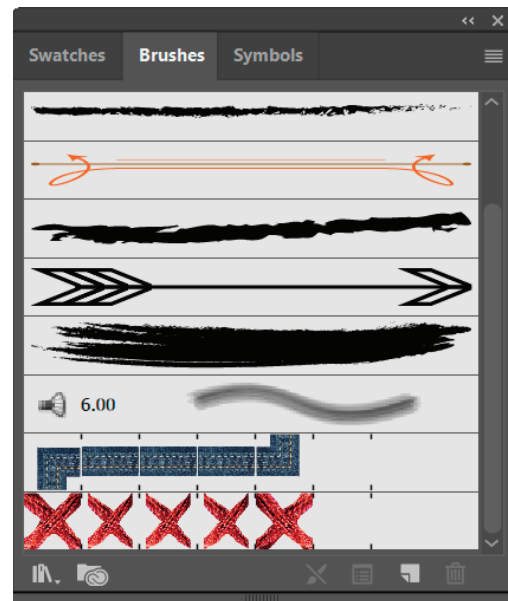

Figure 38 Customized Brushes panel

2. Choose **Save Brush Library** from the **Brushes** panel menu (**Figure 39**).

3. Navigate to the location of where you want to save your brush library, name the file, and click **Save**.

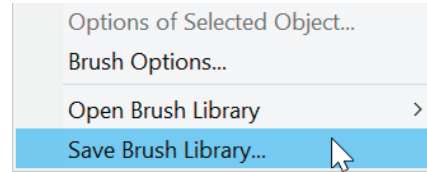   The custom brush library is saved (**Figure 40**).
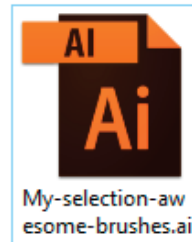

Figure 39 *Detail of Brushes panel menu*

Figure 40 *Saved custom brush library*

How to import brushes into the Brushes panel from another file:

1. Choose **Window** > **Brush Libraries** > **Other Library** and select the file.

    The custom Brush Library panel opens (**Figure 41**)

2. In the Brush Library panel, click on the individual brush definition or all the brush definitions that you need to import and select **Add To Brushes** from the Brush Library panel menu.
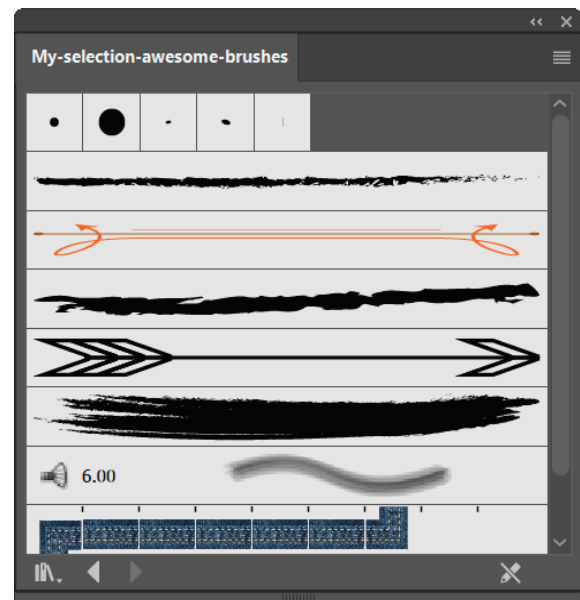

Figure 41 *Custom Brush Library panel*

Painting with a brush made from a photo

Brush definitions can contain or hold images (non-vector artwork). You can define three types of image-based brushes: Scatter, Art, and Pattern. The behavior of the brushes is like any other brush: You can reshape or modify them. Images in a brush take the shape of the stroke; that is, the images can bend, scale, and stretch with the shape and type of stroke. Also, such brushes behave and can be modified in the same way as other brushes, using the Brush Options dialog box. For example, the leftmost image (below) is the original image. When using it in a brush definition, you could draw the three images on the right (**Figure 42**). Each stroke uses different scale options, specified in the Brush Options dialog box.
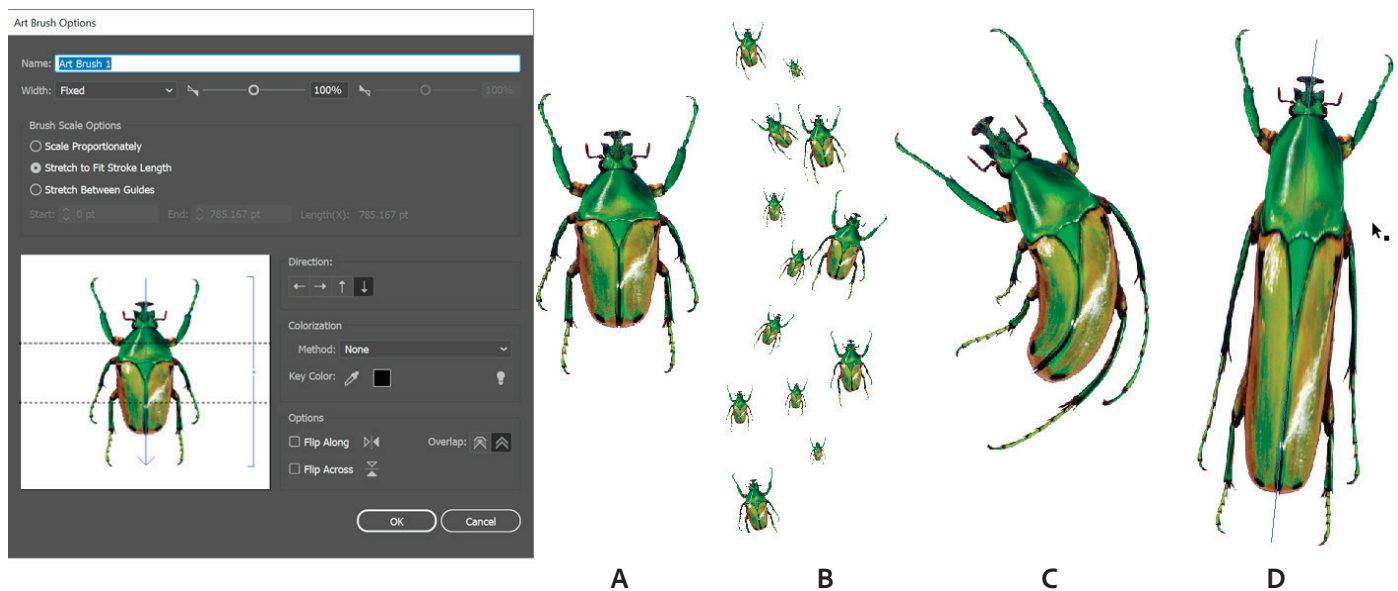

A   B   C   D

Figure 42 Art Brush Options dialog box and A. Original image, B. Image in a brush, scaled proportionately, C. Image in a brush, stretched to fit a curved stroke length, D. Image in a brush, stretched between guides

Note: Using large images in brushes impacts performance. Choose a small image to start with, or resize a large image down to a smaller scale for use as an image-based brush.

How to paint with a brush made from a photo:

1. In Illustrator, open an image file you want to convert into a brush by choosing **File** > **Open**.

   The **Place** dialog box opens.

2. Navigate to the location of the image, and click **Open**. The image opens in Illustrator.

3. Choose the Selection tool from the Tools panel and scale the image down to a maximum width or height of 250 pixels (**Figure 43**).

   Holding down the **Shift** button allows the image to scale proportionally as you resize it.
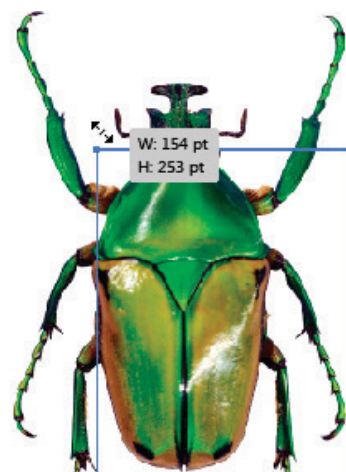

Figure 43 Scale an image down

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This document requires Adobe Illustrator CC 2018. Technical instructions may differ depending on your version.

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4. Choose **Window** > **Brushes** to display the **Brushes** panel.

5. Select the object in the document and drag it over into the **Brushes** panel.

   A small blue line appears in the panel showing you that the object is being added. When you release the mouse, the **New Brush** dialog box appears (**Figure 44**).
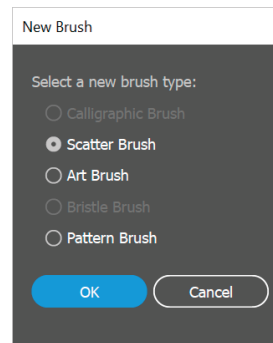
   Three brush options are available: **Scatter Brush**, **Art Brush**, and **Pattern Brush**. The other brush options are dimmed, as you cannot create an image-based brush in these formats.

   You will work with the **Art Brush** option in this section. Be sure to experiment with the other brush options after you finish.

6. Select the **Art Brush** option and click **OK**.

   The **Art Brush Options** dialog box opens (**Figure 42**).

7. Type a name for the brush in the **Name** text field.

8. Select **Scale Proportionately** in the **Brush Scale Options** area (**Figure 45**) and click **OK**.
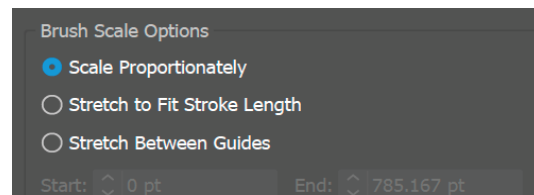
   The **Art Brush Options** dialog box closes.

9. Move the original object off the workspace onto the scratchboard. You will use it to create another brush.

10. Click the newly created brush in the **Brushes** panel (**Figure 46**).
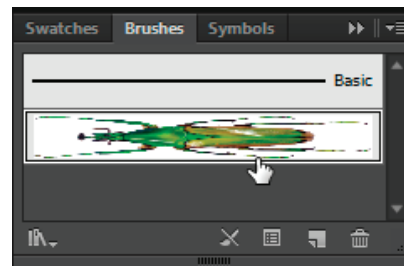
11. Choose the Paintbrush tool in the Tools panel.

12. Drag the Paintbrush tool in different locations to create a series of brush strokes (**Figure 47**).
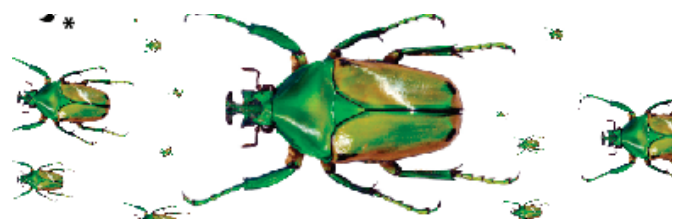
    Observe that the image scales to the relative size of the stroke. Small strokes produce small images and larger strokes create bigger images while maintaining proportion.

13. Create another brush, but this time select **Stretch To Fit Stroke Length** and drag to create a curved path.

    Observe how the image bends around the curve.

14. Create another brush, but this time select **Stretch Between Guides**.

15. Adjust the guide settings by changing the values in the Start and End boxes, or drag the guides in the preview area (**Figure 48**).
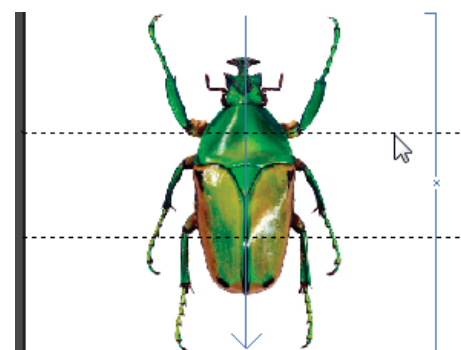
16. Click **OK** to close the **Art Brush Options** dialog box. Observe how the image stretches between the guides.

Figure 44 New Brush dialog box

Figure 45 Art Brush Options dialog box detail

Figure 46 Brushes panel

Figure 47 Image in a brush, scaled proportionately

Figure 48 Drag guides in preview area

Drawing with the Blob Brush tool

You can use the Blob Brush tool to create freeform drawings, much like drawing with pixels in Adobe Photoshop or using natural media tools. The Blob Brush tool is particularly suitable for use with a pressure-sensitive tablet or stylus for creating editable vector art by using natural gestures. Unlike the Pencil and Paintbrush tools, the Blob Brush tool does not create paths; instead, your brush-like gestures create open areas with color. Drawing naturally with the Blob Brush tool delivers a unified area of color you can easily select and edit.

To draw with the Blob Brush tool:

1. Select the **Blob Brush Tool** in the Tools panel (**Figure 49**).

2. In the Control panel, modify some options, including:
   - Stroke color
   - Stroke thickness
   - Brush definition from the Brush picker menu
   - Opacity

3. Paint freehand by dragging on the page (**Figure 50**).

4. Select the Eraser tool in the Tools panel.

5. Use the Eraser tool to edit the vector shape, such as splitting the vector shape into two pieces (**Figure 51**).

6. Choose the Selection tool in the Tools panel, select one piece of the split vector shape, and click on a corner anchor. Drag the corner to scale the shape.

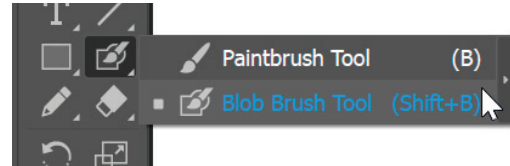   You can now edit the split vector shapes independently (**Figure 52**).
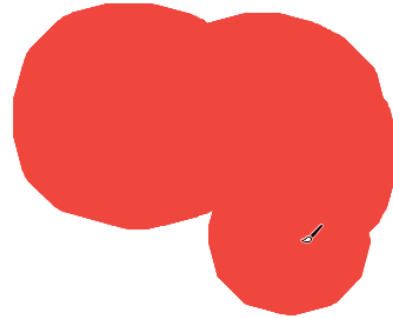

Figure 49 Tools panel
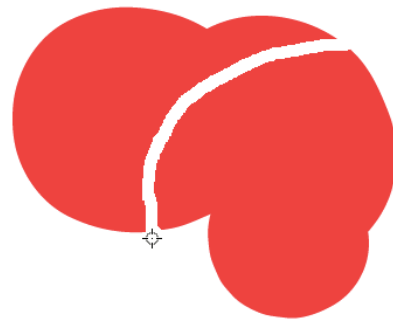

Figure 50 Drawing with the Blob Brush tool

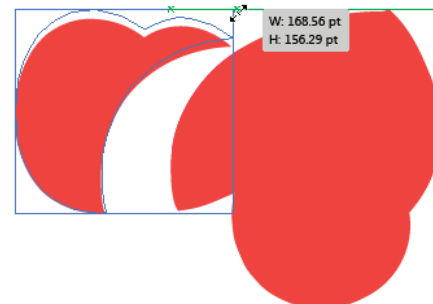*Figure 51* Editing the split vector shape

Figure 52 Editing the split vector shape

Drawing shapes

In addition to using brushes and the Pencil tool, you can draw shapes in Illustrator, such as rectangles, ellipses, and polygons. The colors of the interior and outline of the shape are determined by the fill and stroke colors, respectively.

In this section, you'll learn how to draw a simple shape with stroke and fill, expand a shape, use Live Paint, and create new shapes by using the Shape Builder tool.

How to draw a shape:

1. Click one of the shape tools in the Tools panel, such as the **Polygon Tool** (**Figure 53**).

   Shape tools are located below the Type tool. By default, the Rectangle tool appears in the Tools panel. To access other shapes, click the Rectangle tool and hold down the mouse until the menu of shape tools opens.

2. Set the fill, stroke, and stroke width for the shape in the **Properties** panel (**Figure 54**).

3. Click the canvas where you want to put the shape.
   - For the **Rectangle**, **Rounded Rectangle**, and **Ellipse Tools**, click where you want the upper-left corner of the shape.
   - For the **Polygon**, **Star**, and **Flare Tools**, click where you want the center of the shape.

   A shape options dialog box appears, such as the **Polygon** options dialog box (**Figure 55**).

   Note: Alternately, you can drag on the canvas to make a polygon. You can press the Up Arrow and Down Arrow keys to add and remove sides from the polygon.

4. Enter options for the shape. For the polygon shape, enter a radius and number of sides.

5. Click **OK**.

   The shape options dialog box closes and the shape appears in the document (**Figure 56**).

   You can modify any of the shape's attributes by selecting the shape with the Selection tool and modifying its properties in the **Properties** panel.
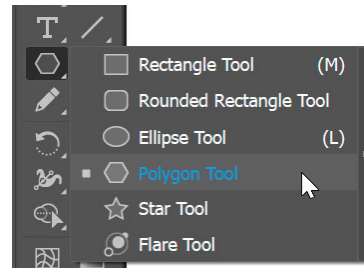

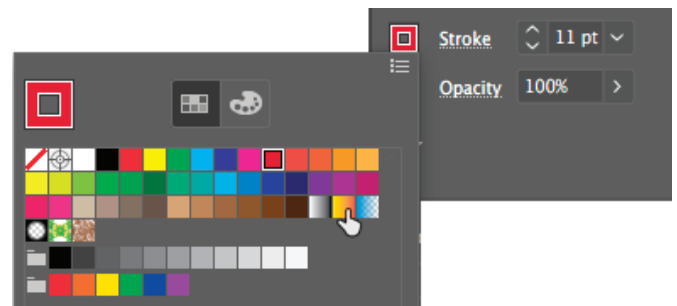*Figure 53 Shape tools in the Tools panel*
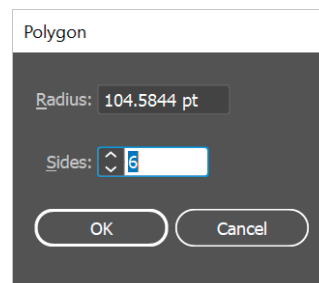

Figure 54 Properties panel detail

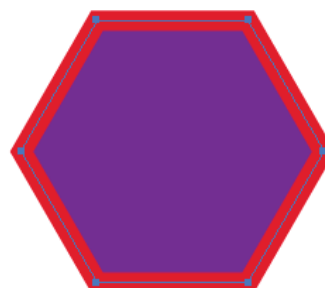*Figure 55 Polygon options dialog box*

Figure 56 Drawn polygon shape.

Expand objects

You can expand an object so you can then divide it into the multiple objects that make up its appearance. For example, if you expand a simple object, such as a circle with a solid-color fill and a stroke, the fill and the stroke each become discrete objects (**Figure 57**). If you expand more complex artwork, such as an object with a pattern fill, the pattern is divided into all of the distinct paths that created it.
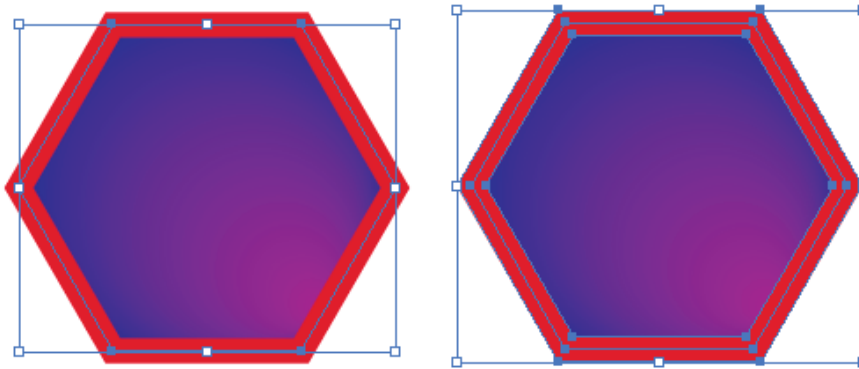

Figure 57 *Before (left) and after (right) expanding an object that has a fill and stroke*

You typically expand an object when you want to modify the appearance attributes and other properties of specific elements within it. In addition, expanding objects may be helpful when you want to use an object that is native to Illustrator in a different application that doesn't recognize the object.

How to expand objects:

1. Choose the Selection tool from the Tools panel and click on a shape in the workspace.

2. Choose **Object** > **Expand**.

   The **Expand** dialog box opens (**Figure 58**).

   Note: If the object has appearance attributes applied to it, the **Object** > **Expand** command is dimmed. In this case, choose **Object** > **Expand Appearance** and then choose **Object** > **Expand**.

3. Set the Expand options:
   - *Object* Expands complex objects, including live blends, envelopes, symbol sets, and flares.
   - *Fill* Expands fills.
   - *Stroke* Expands strokes.
   - *Gradient* Mesh Expands gradients to a single mesh object.
   - *Specify* Sets the tolerance for color values between color stops. Higher numbers help maintain a smooth color transition; low numbers can create a more banded appearance.

4. Click **OK** to close the **Expand** dialog box. The object is expanded.
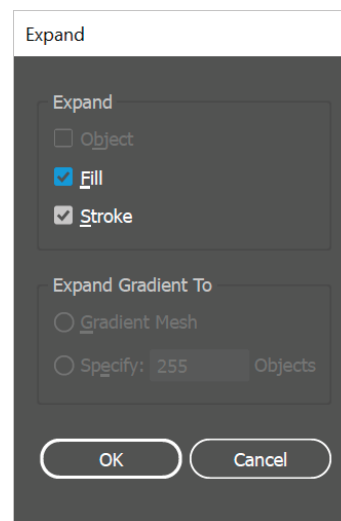

Figure 58 *Expand dialog box*

Paint with Live Paint

Illustrator provides two methods of painting. You can assign a fill, stroke, or both to an entire object. You can also convert the object to a Live Paint group and assigns fills or strokes to the separate edges and faces of paths within it (**Figure 58**). Converting your artwork to Live Paint groups allows you to color them freely, as you would a drawing on canvas or paper. You can stroke each path segment with a different color and fill each enclosed path (**Note**: not just closed paths) with a different color, pattern, or gradient.
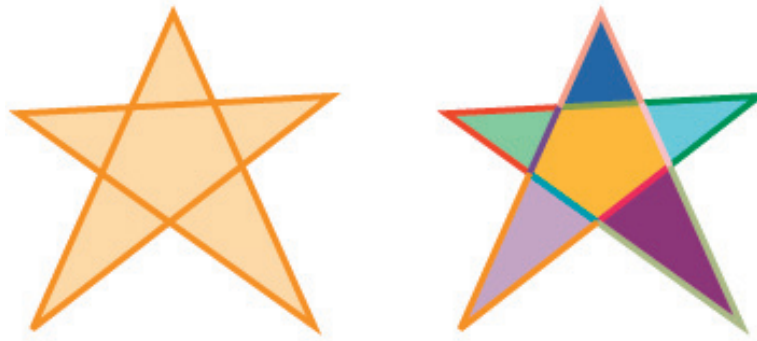

*Figure 59 An object consisting of a single path painted with the existing method has a single fill and a single stroke (left).
The same object converted to a Live Paint group can be painted with a different fill for each face and
a different stroke for each edge (right)*

Live Paint is an intuitive way to create colored drawings. It lets you use the full range of Illustrator's vector drawing tools but treats all the paths you draw as though they are on the same flat surface. That is, no path is behind or in front of any other. Instead, the paths divide the drawing surface up into areas, any of which can be colored, regardless of whether the area is bounded by a single path or by segments of multiple paths. The result is that painting objects is like filling in a coloring book or using watercolors to paint a pencil sketch.

Once you've made a Live Paint group, each path remains fully editable. When you move or adjust a path's shape, the colors that had been previously applied don't just stay where they were, like they do in natural media paintings or image editing programs. Instead, Illustrator automatically reapplies them to the new regions that are formed by the edited paths.

How to create a Live Paint group:

1. Choose the Selection tool from the Tools panel and select one or more paths, compound paths, or both in the workspace.

2. Choose **Object** > **Live Paint** > **Make**.

   A Live Paint group bounding box appears around the selected object (**Figure 60**).

   Note: Certain properties may be lost in the conversion to a Live Paint group, such as transparency and effects, while other objects cannot be converted (such as type, bitmap images, and brushes).

3. Choose **Object** > **Expand**.
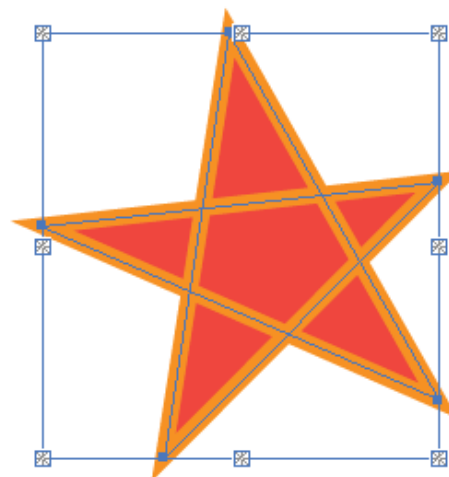
   The **Expand** dialog box opens.

Figure 60 Live Paint bounding box

4. Set the **Expand** options and click **OK** to close the Expand dialog box.

   The object is expanded (**Figure 61**).

5. Click and hold the **Shape Builder Tool** to see and select the **Live Paint Bucket** tool (**Figure 62**).

6. Specify the fill color or stroke color and size you want.

   Note: If you select a color from the **Swatches** panel, the pointer changes to display three colors. The selected color is in the middle and the two adjacent colors on the sides. To use an adjacent color, click the left or right arrow key.

7. To paint a face, click a face to fill it [when the pointer is over a face, it changes to a half-filled paint bucket and highlight lines surround the inside of the fill (**Figure 63**)] or drag across multiple faces to paint more than one face at a time.

   Double-click a face to fill across unstroked edges into adjacent faces (flood fill). Triple-click a face to fill all faces that currently have the same fill.

8. To paint an edge, double-click the **Live Paint Bucket** tool and select Paint Strokes, or temporarily toggle to the Paint Strokes option by pressing Shift, and then click an edge to stroke it, or drag across multiple edges to stroke more than one edge at a time.

   Double-click an edge to stroke all connected edges of the same color (flood stroke). Triple-click an edge to stroke all edges of the same stroke.
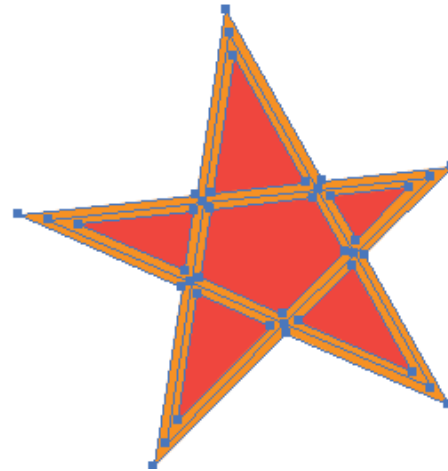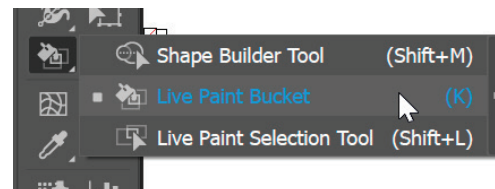

Figure 61 Expanded object
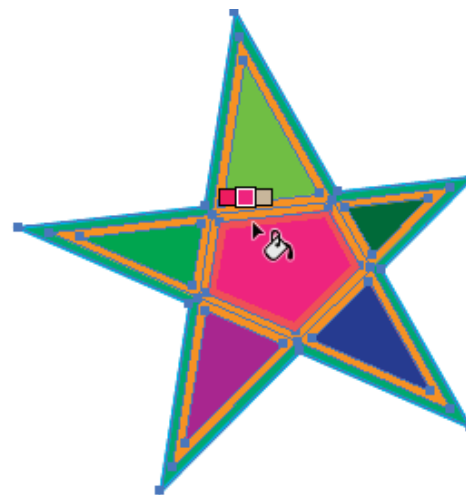

Figure 62 Tools panel

Figure 63 Click to apply color to a fill area

Creating new shapes by using the Shape Builder tool

The Shape Builder tool is an interactive tool for creating complex shapes by merging and erasing simpler shapes. It works on simple and compound paths.

It intuitively highlights edges and regions for a selected artwork that can be merged to form new shapes. An edge is defined as the section of a path that does not intersect any other path of the selected objects. A region is a closed area bounded by edges.

To create a shape with the Shape Builder tool:

1. Create the shapes on which you want to apply the **Shape Builder Tool**.

2. Using the Selection tool, select only the paths you need to merge to create the shape (**Figure 64**).

   Note: Make sure that you select only those paths on which you need to apply the tool.

3. Select the **Shape Builder Tool** from the Tools panel (**Figure 65**).

   By default, the tool is in merge mode, ready to combine different paths.

4. To merge two or more paths, drag across the regions enclosed by the paths. Each region is highlighted as you drag across it (**Figure 66**). Release the mouse button when all the regions are highlighted.

   The regions are merged to form a new shape (**Figure 67**). Notice the topmost circle has not been merged into the shape. In the next step, you will delete a portion of that shape.

   The art style that the new shape inherits depends on the following rules:

   - The art style of the object from where the mouse drag was initiated is applied to the merging shapes.
   - If no art style is available on mouse down, the art style available on mouse release is applied to the merging shapes.
   - If no art style is available on mouse down or mouse release, the art style of the topmost selected object in the Layers panel is applied.

   For coloring, you can override these rules by selecting Color Swatches from the **Pick Color From** menu in the **Shape Builder Tool Options** dialog box. (Double-click the Shape Builder tool to open the **Shape Builder Tool Options** dialog box.)

   Note: An alternative to dragging across the regions to be merged is to **Shift-drag** a rectangular marquee around the regions with the Shape Builder tool. When you release, the regions are merged.
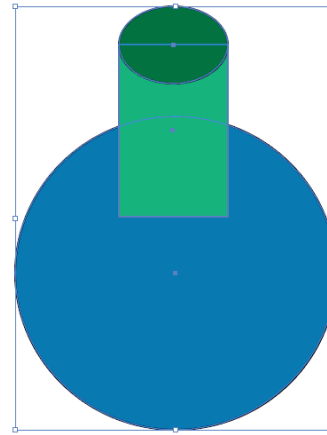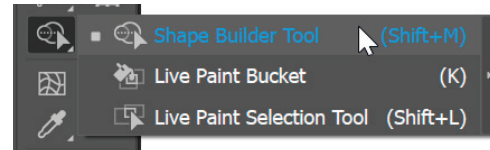

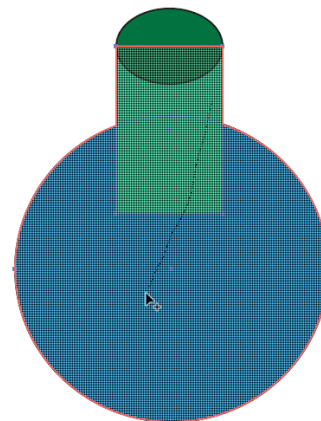*Figure 64 Selecting paths*

Figure 65 Tools panel

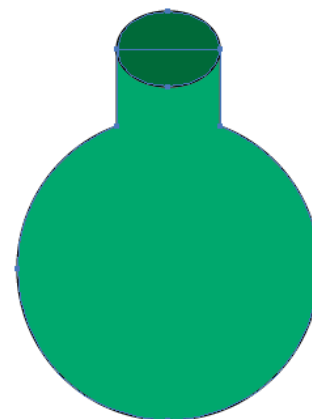*Figure 66 Selecting a region to merge*

Figure 67 Merged shape

5. To use the Erase mode of the Shape Builder tool, **Alt-click** (Windows) or **Option-click** (Mac OS) the closed region you want to delete.

In Erase mode, you can delete regions within selected shapes (**Figure 68**). If you delete a region that is shared by multiple objects, the shapes are broken in such a way that the regions selected by the marquee are removed from the shapes.

You can also delete edges in Erase mode. This option is useful when you want to clear the remaining portions to create the final shape (**Figure 69**).
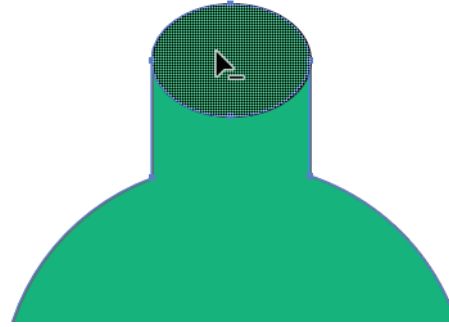
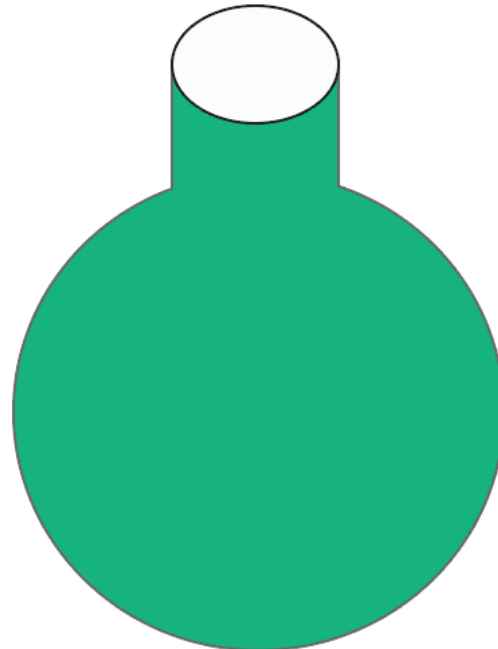*Figure 68* *Deleting a region within a selected shape*

Figure 69 *Final merged shape*

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