

Lesson 5: Working with the Drawing Tools



Adobe Illustrator includes a number of impressive drawing tools that allow you to create a wide variety of artwork with speed and precision.

What you'll learn in this lesson:

- Using the Pen tool
- Editing existing paths
- Working with tracing presets
- Creating vector artwork from placed images


Starting up

Before starting, make sure that your tools and panels are consistent by resetting your workspace. See “Resetting Adobe Illustrator CS6 Preferences” in the Starting up section of this book.









You will work with several files from the ai05lessons folder in this lesson. Make sure that you have loaded the ailessons folder onto your hard drive from www.digitalclassroombooks.com/epub/illustratorcs6. See “Loading lesson files” in the Starting up section of this book.

Working with the Pen tool

The Pen tool is one of the most powerful tools in Illustrator and it allows you to create any line or shape that you need. The Pen tool creates anchor points that can be rounded, smooth, sharp, or angular. Using the Pen tool, you can create any line or shape that you can conceive. Using the Pen tool and mastering line construction is all about understanding the nature of anchor points and how to create and work with them.

 There are two kinds of anchor points that you can create in Illustrator: corner points and smooth points. Corner points are usually seen on linear, hard-edged shapes such as polygons and squares, while smooth points are used to construct sinuous, curved lines. There are two mouse actions that are repeated over and over again when creating anchor points: click and release, which creates corner points; and click and drag, which creates smooth points.

The Pen tool has a versatile feature that allows you to create new anchor points, add anchor points to existing paths, and remove anchor points from existing paths. The tool's appearance changes based on what your cursor is hovering over on the artboard. Pay attention to what the tool cursor looks like, as it will assist you in using all the Pen tool's functions.

PEN TOOL VARIATION	DESCRIPTION
	Only appears as you are in the process of creating a line; it signals that the next anchor point created will continue that line.
	Indicates that the Pen tool will create a new line.
	Indicates that the Pen tool can be used to convert the anchor point it is currently hovering over. This icon only appears when the Pen tool is hovering over the last anchor point that was created in a selected path.
	Indicates that the Pen tool will pick up a path and continue from the end point you are hovering over. This icon only appears next to the Pen tool when it is hovering over the endpoint of a path that you are not currently creating.
	Indicates that the Pen tool will connect the path that is currently being created to the end point of a different path.
	Indicates that the Pen tool will close the path that you are currently creating.
	Indicates that the Pen tool will remove the anchor point that it is currently hovering over. This icon only appears when the Pen tool is hovering over an anchor point on a selected path.
	Indicates that the Pen tool will add an anchor point to the line segment that it is currently hovering over. This icon only appears when the Pen tool is hovering over a line segment on a selected path.

Drawing straight lines

The first Pen tool skill you need to master is creating a straight line. To do this, you make corner anchor points with the Pen tool. Straight lines are automatically generated as a result.

- 1 In Illustrator, choose File > Open. When the Open dialog box appears, navigate to the ai05lessons folder and select the ai0501.ai file. Press OK. This is a practice file containing several different line templates that you will work through in the following exercises.
- 2 Choose File > Save As. In the Save As dialog box, navigate to the ai05lessons folder and type **ai0501_work.ai** into the Name text field; then press Save. In the Illustrator Options dialog box, press OK to accept the default settings.
- 3 In the Control panel at the top of the workspace, select None (⦿) from the Fill color drop-down menu. If necessary, select the color black from the Stroke color drop-down menu and select 2 pt from the Stroke Weight drop-down menu.
- 4 Select the Pen tool (⦿) from the Tools panel and locate the template labeled Exercise 1 on the artboard. Click and release your left mouse button while hovering over label 1. This starts the line by creating the first anchor point.



Use the Pen tool to create the first anchor point.

- 5 Move your cursor to the part of the line labeled 2, and click and release your mouse. The second point of the line is created. The Pen tool automatically draws a straight line between the two points.



Click to create the second anchor point.

- Continue to click and release to complete the line through labels 3, 4, 5, 6, and 7. Notice how the Pen tool automatically continues the line to include each new anchor point.
- After you have set a final anchor point at label 7, press and hold Ctrl (Windows) or Command (Mac OS) and click on any empty area of the page. This deselects and ends the line. If you don't deselect and end the line, the Pen tool continues to link the path to the next anchor that you create.
- Position the cursor over label 1 of Exercise 2. Click and release the left mouse button to create the first anchor point of the new line.
- Position the cursor over label 2. Hold down the Shift key, then click and release to create the second point of the line; the Pen tool automatically connects the two points with a straight line. Because you were holding the Shift key when the second point was created, Illustrator automatically draws a perfectly horizontal line.
- Position the cursor over label 3. Again hold the Shift key and click and release the left mouse button to set a third anchor point. This time, the line created is a perfect vertical line.
- Continue holding down the Shift key while clicking at labels 4, 5, and 6. Doing this draws the line between points 4 and 5 at a perfect 135-degree angle, as the Shift key constrains the angle to 45-degree increments.



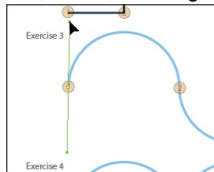
Pressing Shift while clicking allows you to create 90- and 45-degree angles with the Pen tool.

- With a final anchor point at label 6, hold down the Ctrl key (Windows) or Command key (Mac OS) and click on the artboard to deselect and end the line.
- Choose File > Save to save your work.

Drawing curved lines

Straight lines can only take you so far; more organic and complex compositions require you to use curved lines to render objects. You will now complete Exercise 3.

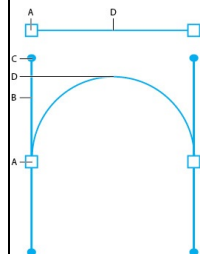
- Position your cursor over label 1 at the beginning of the curved line. Click and, without releasing the mouse, drag your cursor up slightly above the hump of the line to create your first anchor point. As you drag your cursor up, it looks like you are dragging a line away from the point. You are, in fact, creating a direction handle for the anchor point.



Dragging while clicking with the Pen tool allows you to create direction handles.

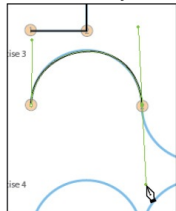
What are direction handles?

When you select or create a smooth point, you can see the direction handles of that point. Direction handles control the angle and length of curves. Direction handles comprise two parts: direction lines and the direction points at the ends of the lines. An anchor point can have zero, one, or two direction handles, depending on the kind of point it is. Direction handles serve as a kind of road map for the line, controlling how the lines approach and leave each anchor point. If the exiting handle is downward-facing, the line leaves the anchor point and goes down. Similarly, the line faces upward if the direction handle is pointing upward.



A. Anchor point. B. Direction Line. C. Direction Handle. D. Line Segment.

- Place your cursor over label 2, located at the end of the first curve in Exercise 3. Click and drag straight down to create the second anchor point. Continue to drag the mouse until you form the curve in the template. As you drag your cursor down, you will notice that a curve is being formed between the two anchor points in real time. As long as you do not release the mouse button, you can reshape this line by dragging the mouse in different directions.
- If you need to modify any of the previous points, choose Edit > Undo or use the keyboard shortcut, Ctrl+Z (Windows) or Command+Z (Mac OS). Do not worry if the curves do not follow the template perfectly, they can be adjusted in future steps.



Dragging while creating the second anchor point allows you to curve the path.

- Place your cursor over label 3, located at the end of the second curve. Click and drag up to create the third anchor point of the line. Continue to drag the mouse until you form the curve indicated by the template. Again, as long as you do not release the mouse button, you can reshape this line depending on the direction in which you drag the mouse.
- Place your cursor over label 4, located at the end of the second curve. As in step 3, click and drag down to create the fourth and final anchor point of the line. Continue to drag the mouse until you form the curve indicated by the template.
- As in the previous exercise, after you have created your final anchor point at label 4, hold down Ctrl (Windows) or Command (Mac OS) and click on the artboard.
- If necessary, use the Direct Select tool (⌘) to reposition the handles and points so the curves follow the path more closely, then choose File > Save to save your work.

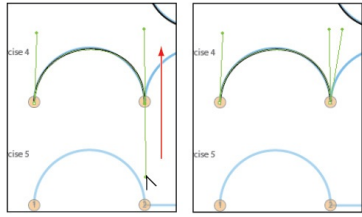
Drawing hinged curves

In the previous exercise, you created S-curves, lines curved in the opposite direction from the previous one. In this exercise, you will create hinged curves, lines that curve in the same direction; in this case, they will all curve up like a scallop. You will now complete Exercise 4.

- Select the Pen tool (⌘) from the Tools panel and position your cursor over label 1 at the beginning of the curved line in Exercise 4. As you did in

the previous exercise, click and drag your cursor up slightly over the hump of the line to create your first anchor point.

- Place your cursor over label 2, located at the end of the first curve. Click and drag straight down to create the second anchor point. Continue to drag the mouse until you form the curve in the template.
- Press and hold the Alt (Windows) or Option (Mac OS) key on the keyboard. This temporarily changes the Pen tool into the Convert Anchor Point tool (\blacktriangledown), which is a separate tool in the Pen tool grouping. Among other things (covered later in this chapter), this tool is used to edit direction handles. Position the Convert Anchor Point tool over the direction handle for the exiting direction line, and click and drag this point so that it points upward. The two direction lines now form a V.



Move the direction handle to change the direction of the next path.



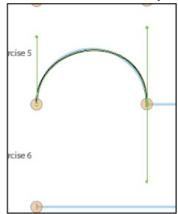
Direction handles control the curvature of the lines in a path. Because the exiting direction handle created in step 3 is pointing down, the line will want to go down. To draw the hinged curve, you must change the angle of this direction handle so that it points upward.

- Place your cursor over label 3, located at the end of the second curve. Click and drag straight down to create the third anchor point. Continue to drag the mouse until you form the curve in the template.
- Again, press and hold Alt (Windows) or Option (Mac OS) to temporarily switch the Pen tool to the Convert Anchor Point tool. Once again, position the Convert Anchor Point tool over the direction handle for the exiting direction line, and click and drag this point so that it points upward and the direction lines form a V.
- Repeat step 4 for the final curve at label 4. After you have created this final anchor point, hold down the Ctrl (Windows) or Command (Mac OS) key and click on the artboard.
- Choose File > Save to save your work.

Drawing curved lines to straight lines

While some compositions you create in Adobe Illustrator are composed of only straight or curved lines, most are some combination of the two. The following two exercises cover how to draw straight and curved lines together as part of the same path. You will now complete Exercise 5.

- Position your cursor over label 1 at the beginning of the curved line in Exercise 5. Hold the Shift key, and click and drag your cursor up slightly above the hump of the line to create your first anchor point. As you drag your cursor upward, your movement is constrained to a perfectly vertical line. Release the mouse before releasing the Shift key.
- Place your cursor over label 2, located at the end of the first curve. Again, while holding the Shift key, click and drag straight down to create the second anchor point. Continue to drag the mouse until you form the curve in the template.

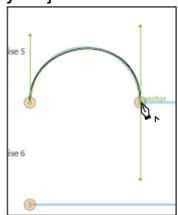


Create another curved path.



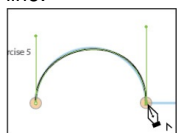
Direction handles control the curvature of the lines in a path. Because the exiting direction handle created in step 2 is pointing down, the line will want to go down. If you drag the direction point so that the line points up as in the previous exercise, it will want to curve up. To form a straight line, however, you want to remove this direction handle entirely, thus converting the anchor point into a corner point.

- Position your cursor over the anchor point you created in step 2. The Pen tool cursor changes, giving you the ability to convert the anchor point you just created.



The Pen tool cursor changes, allowing you to modify the anchor point.

- While hovering over the anchor point, click the mouse. This collapses the anchor's outgoing direction handle, allowing you to create a straight line.



Collapse the direction handle.

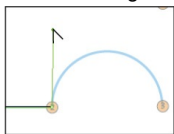
- Place the cursor over label 3. Hold the Shift key on the keyboard, and click at label 3 to create a straight line to finish the path.
- After you have created your final anchor point at label 3, hold down Ctrl (Windows) or Command (Mac OS) and click on the artboard to deselect and end the line.
- Choose File > Save to save your work.

Drawing straight lines to curved lines

Now, you will work from the opposite direction and connect straight lines to curved lines. Practice with Exercise 6.

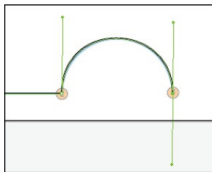
- Locate the template labeled Exercise 6. Hold the Pen tool over the start of the line (labeled 1). The cursor changes (\blacktriangle), indicating that you will start a new line. Click and release your left mouse button while hovering over label 1. This starts the line by creating the first anchor point.
- Place the cursor over label 2. Hold the Shift key and click at label 2 to create a perfectly straight line between points 1 and 2 on the path.
- Position your cursor over the anchor point you created in step 2. The Pen tool cursor changes (\blacktriangle), indicating that you can change the direction of the direction handle.

4 While hovering over the anchor point, click and drag upward in the direction of the curve you want to draw. This creates a new direction handle.



Change the direction of the direction handle.

5 Position the Pen tool over label 3. Click and drag down to create the curve seen in the template.



Finish the path by creating a curve.

6 After you have created your final anchor point at label 3, hold down the Ctrl (Windows) or Command (Mac OS) key and click on the artboard to deselect and end the line.

7 Choose File > Save, then choose File > Close.

Tracing images

Illustrator is often used to convert artwork that has been scanned or rendered in a pixel-based painting program, like Adobe Photoshop, into crisp vector line art. There are two ways to trace images in Illustrator CS6. You can manually trace them using template layers and drawing tools or you can use the new Image Trace feature, discussed in further detail later in this section, that will automatically convert a bitmap image into a vector graphic.

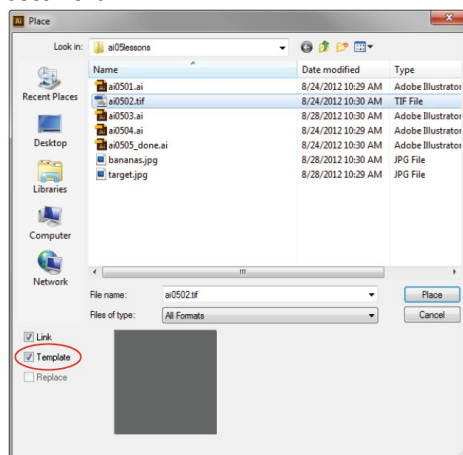
In the first part of the exercise, you will place a scanned image as a template and retrace it using the skills you just learned with the Pen tool. In the second part of the exercise, you will learn how to use the improved Image Trace feature, equipped with built-in presets and custom settings, to convert a bitmap image into a vector graphic.

Placing an image as a template

1 Create a new Illustrator document by choosing File > New. In the New Document dialog box, type **ai0502_work** into the Name text field. Choose Print from the Profile drop-down menu. Choose Letter from the Size drop-down menu, if it is not already selected. Press OK.

2 Select File > Save. Make sure that you are in the ai05lessons folder, and keep the type Adobe Illustrator. When the Illustrator Options dialog box appears, press OK.

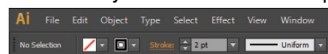
3 Choose File > Place. In the Place dialog box, navigate to the ai05lessons folder and select the ai0502.tif file. Select the Template check box at the bottom of the Place dialog box to import the selected artwork as a template layer. Press Place. A faint outline of a truck appears in your document.



Turn your artwork into a template before placing it in on the artboard.

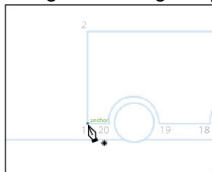
4 Select the Move tool (↔), and then click anywhere on the artboard to deselect the truck artwork.

5 In the Control panel, choose None (a) from the Fill Color drop-down menu and choose the color black from the Stroke Color drop-down menu, if it isn't already selected. Choose 2 pt from the Stroke Weight drop-down menu.



Set the attributes for the vector stroke.

6 Select the Pen tool (⌵) from the Tools panel. Position the cursor near label 1, then click and release to create the first anchor point of the path along the tracing template for the truck. If necessary, increase the magnification to see the template more clearly.



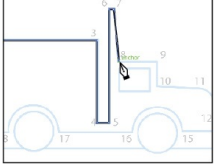
Create the first anchor point of the truck.

7 Press and hold the Shift key and click along the truck outline near label 2. Because you held down the Shift key, Illustrator creates a straight 90° line to the second anchor point.

8 Press and hold the Shift key, and click at label 3 to continue tracing the truck's outline.

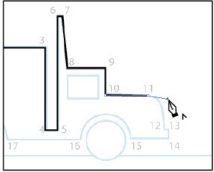
9 Continue to hold down the Shift key, and click along the truck body at labels 4, 5, 6, and 7.

10 The line between labels 7 and 8 is diagonal, and not on a 45° or 90° angle, so release the Shift key and click at label 8.



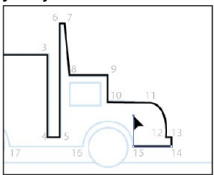
Continue outlining the truck.

- 11 Again, press and hold the Shift key, and click at labels 9 and 10.
- 12 Release the Shift key on the keyboard and click at label 11. Up to this point, the exercise has dealt entirely with creating straight lines and corner points; for the line between labels 11 and 12, you need to create a curved line. Because the point created at label 11 is a corner point, the Pen tool automatically will default to creating a straight line between this anchor and the next anchor point. You will change this behavior by converting the anchor point from a corner to a curved anchor point.
- 13 Hover the Pen tool over the anchor point created at label 11, and look for the Convert Anchor Point symbol (↷) to appear next to the tool. Click and drag with the tool in the direction of the curve to create a new direction handle.



As you drag to create the directional handle, the cursor has the appearance of an arrowhead without a stem.

- 14 Click with the Pen tool at label 12 to create a smooth point and complete the line.
- 15 Hold the Shift key on the keyboard, and click labels 13, 14, then 15.
- 16 The half circle between labels 15 and 16 presents the same challenge that you faced previously. Again, hover the Pen tool over the anchor point you just created. While holding the Shift key, click and drag upward to create a constrained directional handle.



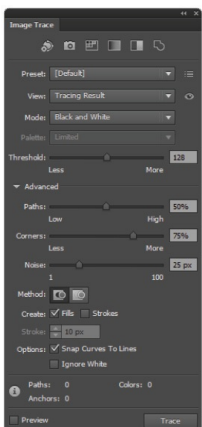
Move the direction handle up to start another curve.

- 17 At label 16, click and drag the cursor down to create a new smooth point and continue the line.
- 18 Position the cursor over the anchor point that you just created at label 16, and click on it when you see the Convert Anchor Point symbol (↷) appear next to the Pen tool. Hold down the Shift key and click at label 17 to convert the curve point to a corner point.
- 19 Repeat the process, explained in step 18, until you reach the anchor point numbered 20. After you have collapsed the anchor point at label 20, position your cursor over label 1. A circle appears next to the Pen tool (○), indicating that this action will close the path you have just drawn. Click on the anchor point to complete the line and close the path.
- 20 Choose File > Save, then choose File > Close.

Placing an image using Image Trace

Adobe Illustrator added tracing options several versions ago with the Live Trace feature, but it did have some limitations. Illustrator CS6 now uses a new tracing engine and Image Trace panel. The results are cleaner, more accurate, crisper and reliable using this new technology.

When you place a bitmap image in your document, you can access Image Trace in two ways: using the default presets located in the Control panel or using the new Image Trace panel.



The new Image Trace panel.

Along the top of the Image Trace panel are six preset buttons: Auto-Color, High Color, Low Color, Grayscale, Black and White, and Outline. Simply select your image and choose one of the default presets. The preset you choose will preview live on the artboard.

To customize the results, you may want to fine-tune the trace, which can be done manually using the options in the Image Trace panel. You can control the number of colors used, path and corner appearances, complexity of the tracing, and more.

Image Trace Options

Preset: Specifies 11 types of tracing presets.

View: Specifies the view of the traced object. You can choose to view the tracing result, source image, outlines, and other options.

Mode: Specifies if the tracing result will be in color, grayscale or black-and-white.

Palette: Specifies the palette used to determine the number of colors in the tracing result. To let Illustrator determine the colors, select Automatic (this option is available only when the Mode is set to Color).

Color settings: Depending on what is selected for the Mode and Palette options, the following color settings are displayed:

Colors: The number of colors used in the tracing result (this option is available only when Mode is set to Color).

Grays: The number of grays used in the tracing result (this option is available only when Mode is set to Grayscale).

Threshold: Value for generating a black-and-white tracing result from the original image (this option is available only when Mode is set to Black and White).

Paths: Controls the distance between the traced path shape and the original path shape. The lower the value, the tighter the path fits; the higher the value, the looser the path fits.

Corners: Specifies the corner appearance. A higher value results in more corners.

Noise: Determines the pixel area that is ignored while tracing.

Method: Specifies a method for tracing:

Abutting — This option creates paths that are cutout.

Overlapping — This option creates paths that are stacked.

Fills: Creates filled regions in the tracing result.

Strokes: Creates stroked paths in the tracing result.

Snap Curves To Lines: Determines if curved lines are to be replaced with straight lines.

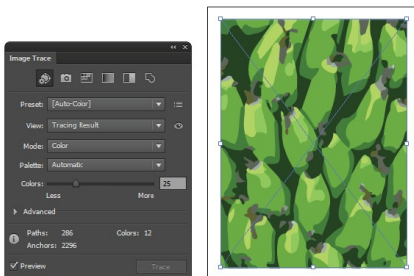
Ignore White: Specifies if White filled areas are to be replaced with no fills.

- 1 Choose File > Open. In the Open dialog box, select the ai0503.ai file and press Open. This Illustrator file consists of two images already placed for you on separate layers for this exercise.
- 2 Choose File > Save As. In the Save As dialog box, make sure that you are in the ai05lessons folder and name the file **ai0503_work.ai**, then press Save. When the Illustrator Options dialog box appears, press OK.
- 3 You will first work with a picture of bananas, converting it from a bitmap image to a vector image. Select the Zoom tool (⌘) in the Tools panel and click once on the center of the page to enlarge the view so you can see the tracing results better.
- 4 Using the Selection tool (⌘), click on the picture, then choose Window > Image Trace. The Image Trace panel will appear. Position the panel to the side of your image so you can view both the panel and image at the same time.



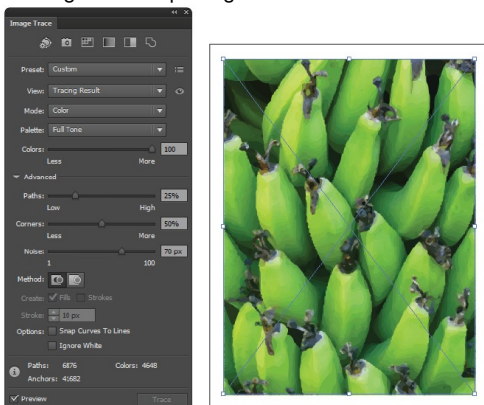
Click on the picture and open the Image Trace panel.

- 5 On the top of the panel are six preset options. Click on the Auto-Color button. The Auto-Color preset will preview live on the artboard.



Press the Auto-Color preset and preview the results on the artboard.

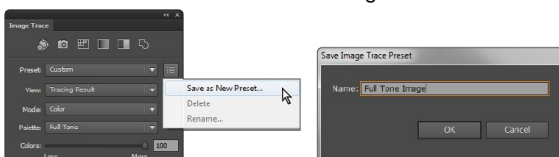
- 6 The default preset gets you started, but you may want to fine-tune the tracing results before expanding the final image. If you do not see the Advanced options, click the arrow to the left of Advanced in the Image Trace panel to expand the advanced options.
- 7 From the Palette drop-down menu, select **Full Tone**. In the Advanced option section, type **25%** in the Paths, **50%** in the Corners and **70 px** in the Noise text fields, then press Enter (Windows) or Return (Mac OS). As you can see, these small adjustments produce a much better rendering of the original bitmap image.



Make some custom adjustments to enhance the image tracing results.

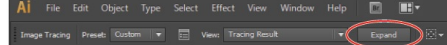
To view your original image, click and hold the visibility icon located to the right of the View drop-down menu. Let go of the mouse button to turn off the preview and continue making adjustments.

- 8 Once you are satisfied with the results, you can save your own preset to use again on other images. Click on the Preset panel menu and select Save as New Preset. In the Save Image Trace Preset dialog box, type **Full Tone Image** then click OK.



Save your own custom preset.

- 9 In the Control panel, click the Expand button to finalize the trace and expand your image into a fully editable vector image. Try using the Selection and Direct Selection tools to experiment with the results.



Click **Expand** in the Control panel to complete the vector trace.

10 Choose **File > Save**. Leave the file open for the next exercise.

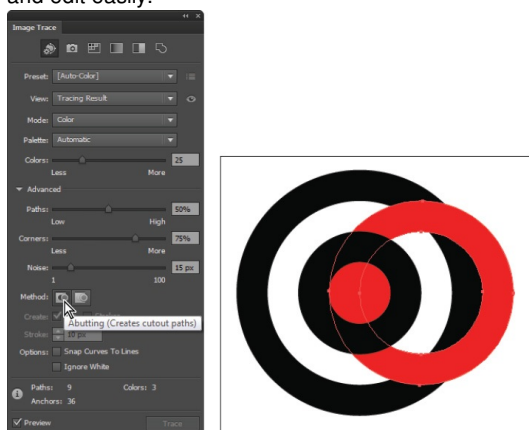
Working with the new Image Trace Method option

One of the new features worth experimenting with in the Image Trace panel is the Method option. There are 2 methods to choose from:

- **Abutting** — This option creates cutout paths.
- **Overlapping** — This option creates stacked paths.

To understand the difference between these two methods, perform the following steps:

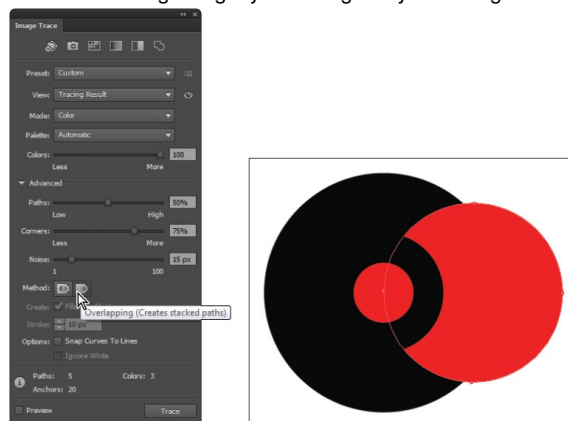
- 1 If the Layers panel is not visible, choose **Windows > Layers** or press the Layers button (☞) in the dock on the right side of the workspace. In the Layers panel, press the visibility icon (☑) to the left of the Bananas layer to hide it, then press the visibility icon to the left of the Target layer to show it.
- 2 If the Image Trace panel is not visible, choose **Windows > Image Trace**. Using the Selection tool (☛), click on the picture of the target to select it. In the Method section in the Image Trace panel, click on the Abutting option. At the top of the panel, click on the Auto-Color preset button (■), then click on the Expand button in the Control panel.
- 3 Click anywhere on the artboard to deselect the image. Select the Direct Selection tool (☞) from the Tools panel, then click and drag the outer red circle on the target slightly to the right. You will notice that by choosing the Abutting option, the paths are cut out in sections that you can move and edit easily.



Choose the **Abutting** method in the Image Trace panel.

The results.

- 4 Now let's try the Overlapping method to see the difference. Choose **Edit > Undo Move** to reposition the red circle back into place, then choose **Edit > Undo Expand Tracing** to undo the tracing of the image and bring it back into its original bitmap state.
- 5 With the target still selected, click on the Auto-Color preset button (■) in the Image Trace panel, then select the Overlapping button for the Method. Click on the Expand button in the Control panel.
- 6 Click anywhere on the artboard to deselect the image. Select the Direct Selection tool (☞) from the Tools panel, then click and drag the outer red circle on the target slightly to the right. By choosing the Overlapping method, the paths stack on top of each other.



Choose the **Overlapping** method in the Image Trace panel.

7 Choose **File > Save**, then **File > Close**.

There are many options to explore within the new Image Trace panel. Try placing your own bitmap image and experimenting with the various tracing results.

Other drawing tools

While the Pen tool is definitely the most versatile drawing tool in the application, there are several other drawing tools that exist to fulfill specific functions.

Using the Line Segment and Arc tools

As the tool names imply, the Line Segment and Arc tools create line segments and arcs. As you learned in the previous exercises, the Pen tool can also create lines and arcs. However, unlike the line segments and arcs that can be created with the Pen tool, each new line or arc is separate and unique from the previous one.

- 1 Choose **File > Open**. In the Open dialog box, navigate to the ai05lessons folder and select the ai0504.ai file. Press **Open**.
This is a practice file containing several different line templates that you will work through in the following exercises. Choose **File > Save As**. In the Save As dialog box, navigate to the ai05lessons folder, and type **ai0504_work.ai** in the Name text field. Press **Save**. In the resulting Illustrator Options dialog box, press **OK** to accept the default settings.
- 2 In the Control panel, choose **None** (■) from the Fill Color drop-down menu and choose the color black from the Stroke Color drop-down menu, if it isn't already selected. Choose **2 pt** from the Stroke Weight drop-down menu.
- 3 Select the Line Segment tool (☞) from the Tools panel on the left, and locate the template labeled Exercise 1. Hold the Line Segment tool over the start of the first line (labeled 1). Click and drag with your mouse from label 1 to label 2 to create a line segment.