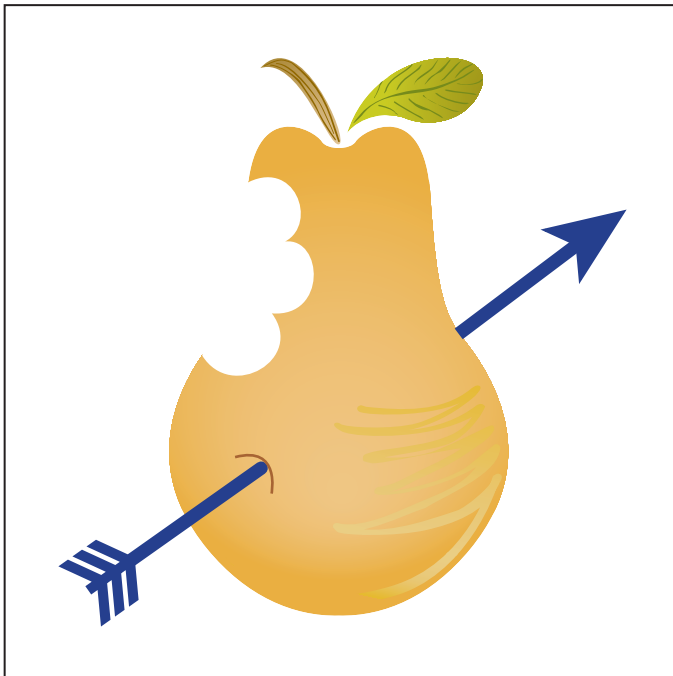


Drawing with the Pen



The pen tool is a powerful tool for drawing straight lines, Bézier curves, and complex shapes. While the pencil tool is easier for drawing and editing lines, the pen tool can be more precise. You'll practice drawing with the pen tool by creating an illustration of a pear.

In this lesson, you'll learn how to do the following:

- Draw straight lines
- End path segments and split lines
- Draw curved lines
- Select curve segments and adjust them
- Draw different types of curves, smooth and pointed
- Edit curves, changing from smooth to pointed and vice versa

Getting Started


In this lesson, you'll create an illustration of a pear pierced by an arrow. Before you begin you'll need to restore the default preferences for Adobe Illustrator® and then you'll open the finished art file for this lesson to see what you'll be creating.

1 To ensure that the tools and palettes function exactly as described in this lesson, delete or deactivate (by renaming) the Adobe Illustrator 8.0 preferences file. (See “Restoring default preferences” in Appendix A, “Improving Performance,” of the *Adobe Illustrator 8.0 User Guide*.)

2 Start Adobe Illustrator.

3 Choose File > Open and open the finished art file, *04_b.ai*.

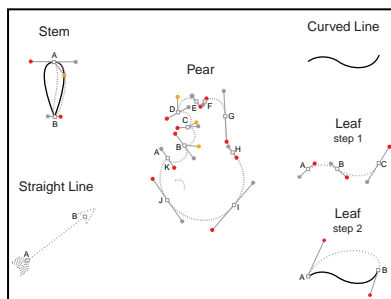
(The path to the file is: Adobe Illustrator 8.0 application folder > Training > Tutorial > AI_04 > 04_b.ai.)

4 If you like, choose View > Zoom Out to make the finished artwork smaller and leave it on your screen as you work. (Use the hand tool () to move the artwork where you want it in the window.) If you don't want to leave the image open, choose File > Close.

Now open the start file to begin the lesson.

5 Choose File > Open and open the start file, *04_a.ai*.

(The path to the file is: Adobe Illustrator 8.0 application folder > Training > Tutorial > AI_04 > 04_a.ai.)



6 Choose File > Save As, name the file **Pear.ai**, and click Save. In the Illustrator Format dialog box, select version 8.0 of Illustrator and click OK.

7 Hold down Shift and press Tab once to hide all of the palettes. (Pressing Shift+Tab toggles between hiding and displaying the palettes. Pressing Tab alone hides or shows the toolbox as well.)

Drawing straight lines

You draw straight lines by using the pen tool to create a starting anchor point and an ending anchor point. You can create straight lines that are vertical, horizontal, or diagonal by holding down Shift as you click with the pen tool. This is called *constraining* the line.

We've created a template layer in this file so you can practice using the pen tool by tracing over the template.

You'll begin by drawing the straight line for the arrow.

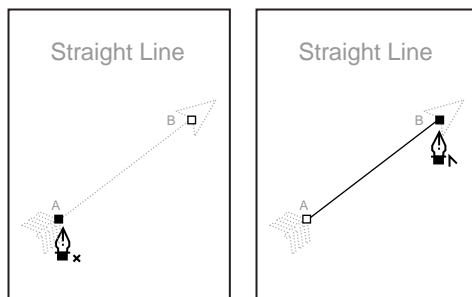
1 Choose View > Straight Line to zoom into the left corner of the template.

Separate views that show different areas of the template at a higher magnification were created for this document and added to the View menu. (To create a custom view, choose View > New View. For information, see "Viewing artwork" in Chapter 2 "Looking at the Work Area," in the *Adobe Illustrator 8.0 User Guide*.)

2 Select the pen tool (🖋) in the toolbox and move the pointer to the dashed line in the artwork. Notice that the pen tool pointer has a small x next to it. This indicates that clicking will begin a new path.

3 Click point A at the left end of the line to create the starting anchor point—a small solid square.

4 Click point B at the right end of the line to create the ending anchor point.



Click once to begin a straight line.

Click again to end it.

When you click a second time, a carat (^) appears next to the pen tool. The carat indicates that you can split the anchor point to create a direction line for a curve by dragging the pen tool from this anchor point. The carat disappears when you move the pen tool away from the anchor point.

You must end the path before you can draw other lines that aren't connected to the path.

5 End the path using one of the following methods:

- Hold down Ctrl (Windows®) or Command (Mac® OS) to activate the current selection tool, and click away from the path to deselect it.

- Choose Edit > Deselect All.
- Click the pen tool in the toolbox.

Now you'll make the straight line thicker by changing its stroke weight.

- 6 Select the selection tool (⌘) in the toolbox and click the straight line to select it.
- 7 Choose Window > Show Stroke to display the Stroke palette.
- 8 In the Stroke palette, type 3 points in the Weight text box and press Enter or Return to apply the change.

Splitting a path

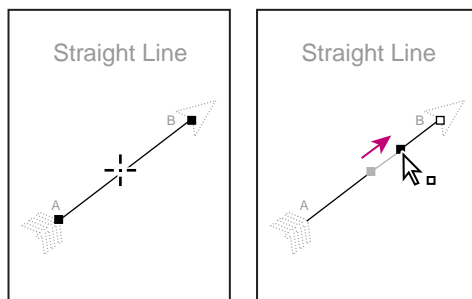
To continue creating the arrow for this illustration, you'll split the path of the straight line using the scissors tool and adjust the segments.

- 1 With the straight line still selected, select the scissors tool (✂) in the toolbox and click in the middle of the line to make a cut.

Cuts made with the scissors tool must be on a line or a curve rather than on an endpoint.

Where you click, you see a new selected anchor point. However, the scissors tool actually creates two anchor points each time you click. Because they are on top of each other, you can see only one.

- 2 Select the direct-selection tool (⌘) in the toolbox and position it over the cut. The small hollow square on the pointer indicates that it's over the anchor point. Grab the new anchor point and drag it up to widen the gap between the two split segments.



Click with the scissors tool to cut the line.


Drag to separate the new line segments.

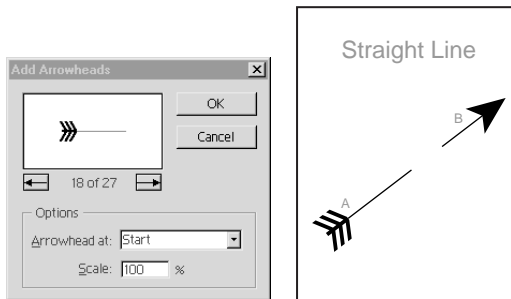
Adding arrowheads

Adobe Illustrator lets you add premade arrowheads and tails to open paths by applying a Stylize filter. Now you'll add an arrowhead to the ending point of one line segment and a tail to the starting point of the other line segment.

- 1 With the top line segment selected, choose Filter > Stylize > Add Arrowheads.
- 2 In the Add Arrowheads dialog box, click an arrow button to select the number 2 style of arrowhead (a thumbnail picture of it appears in the dialog box). Choose End from the pop-up menu if it's not already selected and click OK.

Illustrator adds the arrowhead to the end of the line (the last anchor point created on the uncut line).

3 Using the direct-selection tool () , select the bottom line segment and choose Filter > Add Arrowheads to open the dialog box again. Select the number 18 style of arrowhead, choose Start from the pop-up menu, and click OK to add a tail to the starting point of the line.



You can reapply the same arrowhead style to other selected objects by choosing Filter > Apply Add Arrowhead.

4 Choose Edit > Deselect All to deselect the artwork, and then choose File > Save.


Drawing curves

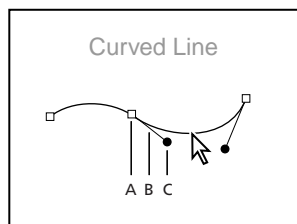
In this part of the lesson, you'll learn how to draw smooth curved lines with the pen tool. In vector drawing programs such as Adobe Illustrator, you draw a curve, called a Bézier curve, by setting anchor points and dragging to define the shape of the curve. Although this takes some getting used to, this type of drawing gives you the most control and flexibility in computer graphics.

You'll draw the pear, its stem, and a leaf. You'll begin by examining a single curve and then drawing a series of curves together, using the template guidelines to help you.

Selecting a curve

1 Choose View > Curved Line to display a view of a curved line on the template.

2 Using the direct-selection tool () , click one of the segments of the curved line to view its anchor points and its direction lines, which extend from the points. The direct-selection tool lets you select and edit individual segments in the curved line.



*A. Anchor point B. Direction line
C. Direction point (or handle)*

As their names imply, the anchor points anchor the curved segments, and the direction lines control the direction of the curves. You can drag the direction lines or their endpoints, called *direction points* or *handles*, to adjust the shape of the curve.

Anchor points, direction points, and direction lines are aids to help you draw. They always appear in the current layer color—in this case, blue. Anchor points are square, and when selected appear filled; unselected, they appear unfilled, like hollow squares. Direction points are round. These lines and points do not print with the artwork.

By selecting the curve, you also select the paint attributes of the curve so that the next line you draw will have the same attributes. (For more on paint attributes, see the “Painting” tutorial; or see Chapter 7, “Working with Color,” in the *Adobe Illustrator 8.0 User Guide*.)

Drawing the leaf

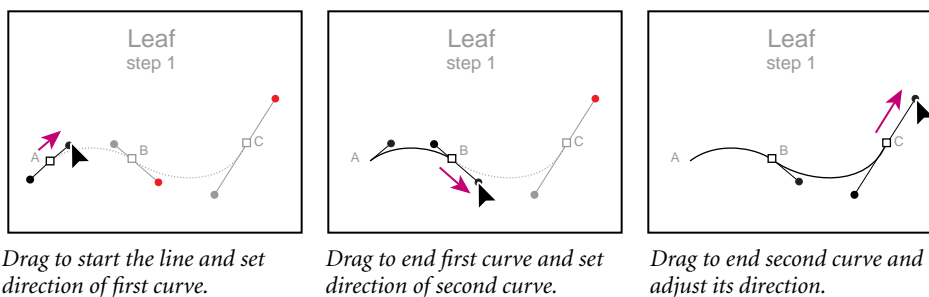
Now you’ll draw the first curve of the leaf.

- 1 Choose View > Leaf or scroll down to see the guides for Leaf step 1.

Instead of dragging the pen tool to draw a curve, you drag it to set the starting point and the *direction* of the line’s curve. When you release the mouse, the starting point is created and two direction lines are formed. Then you drag the pen tool to end the first curve and to set the starting point and direction of the next curve on the line.

- 2 Select the pen tool (✎) and position it over point A on the template. Press the mouse button and drag from point A to the red dot. Then, release the mouse.

Next, you’ll set the second anchor point and its direction lines.



- 3 Press the mouse button and drag from point B to the next red dot. Then, release the mouse. Illustrator connects the two anchor points with a curve that follows the direction lines you have created. Notice that if you vary the angle of dragging, you change the amount of curve.

If you make a mistake as you draw, you can undo your work by choosing Edit > Undo. Adobe Illustrator by default lets you undo a series of actions—limited only by your computer’s memory—by repeatedly choosing Edit > Undo. (To set the minimum number of undos, choose File > Preferences > Units & Undo.)

- 4 To complete the curved line, drag the pen tool from point C on the template to the last red dot and release the mouse.

5 Ctrl-click (Windows) or Command-click (Mac OS) away from the line to indicate the end of the path. (You must indicate when you have finished drawing a path. You can also do this by clicking the pen tool in the toolbox, or by choosing Edit > Deselect All.)

Drawing different kinds of curves

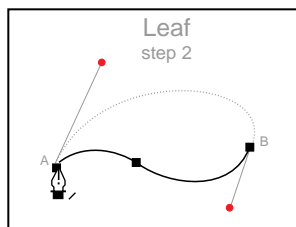
Now you'll finish drawing the leaf by adding to an existing curved segment. Even if you end a path, you can return to the curve and add to it at a later time. The Alt (Windows) key or Option (Mac OS) key lets you control the type of curve you draw.

1 Scroll down to the instructions on the template for Leaf step 2.

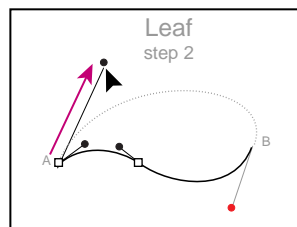
You'll add a *corner point* to the path. A corner point lets you change the direction of the curve. A *smooth point* lets you draw a continuous curve.

2 Position the pen tool over the end of the line at point A. The slash next to the pen tool indicates that you'll continue the path of the line rather than start a new line.

3 Hold down Alt (Windows) or Option (Mac OS) and notice that the status bar in the lower left corner of the window displays "Pen: Make Corner." Now Alt/Option-drag the pen tool from the anchor point to the red dot. Then release the mouse.



A slash indicates pen tool is aligned with anchor.

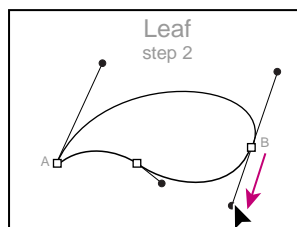
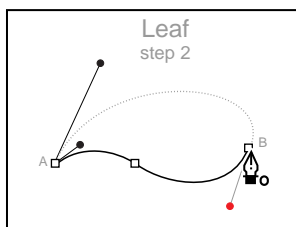


Alt/Option-dragging creates corner point.

So far, all of the curves you have drawn have been open paths. Now you'll draw a closed path, in which the final anchor point is drawn on the first anchor point of the path. (Examples of closed paths include ovals and rectangles.) You'll close the path using a smooth point.

4 Position the pointer over anchor point B on the template. A small open circle appears next to the pen tool indicating that clicking will close the path. Press the mouse and drag from this point to the second red dot.

Notice the direction lines where you close the path. The direction lines on both sides of a smooth point are aligned along the same angle.

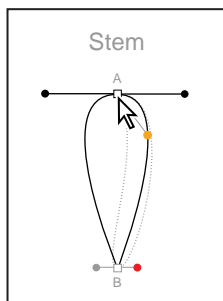


5 Ctrl-click (Windows) or Command-click (Mac OS) away from the line and choose File > Save.

Changing a smooth curve to a corner and vice versa

Now, you'll create the stem by adjusting a curved path. You'll convert a smooth point on the curve to a corner point, and a corner point to a smooth point.

- 1 Choose View > Stem to display a magnified view of the stem.
- 2 Select the direct-selection tool (⌘) in the toolbox, position the pointer over point A at the top of the curve to display a hollow square on the pointer, and then click the anchor point to select it and display its blue direction lines for the smooth point.



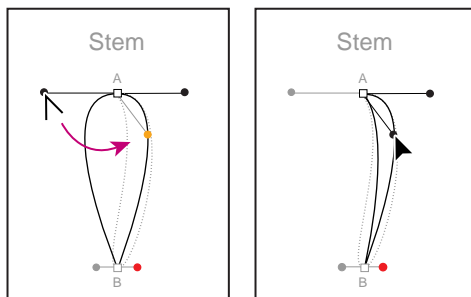
- 3 Select the convert-direction-point tool (⌘) from the same group as the pen tool in the toolbox.



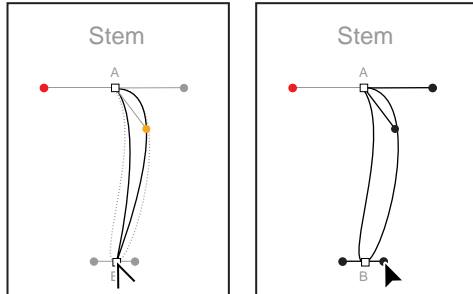
(When the pen tool is the current tool, a shortcut to get the convert-direction point tool is to press Alt (Windows) or Option (Mac OS).)

- 4 Use the convert-direction-point tool to grab the left direction point (on top of the red dot) on the direction line and drag it to the gold dot on the template and then release the mouse.

Dragging with the convert-direction-point tool converts the smooth anchor point to a corner point and adjusts the angle of the left direction line.



5 Using the convert-direction-point tool (↶), grab the bottom anchor point and drag from point B to the red dot to convert the corner point to a smooth point, rounding out the curve, and then release the mouse.



Two direction lines emerge from the anchor point, indicating that it is now a smooth point.

When using the convert-direction-point tool, keep these guidelines in mind:

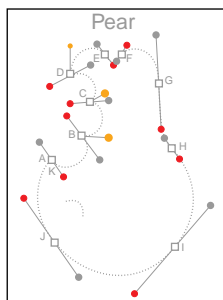
- Drag from the curve's anchor point for a smooth point and continuous curve.
- Click the curve's anchor point or drag a handle (direction point) of the curve for a corner point on a discontinuous curve.

6 Choose File > Save.

Drawing the pear shape

Now you'll draw a single, continuous object that contains smooth points and corner points. Each time you want to change the direction of a curve at a point, you'll hold down Alt (Windows) or Option (Mac OS) to create a corner point.

1 Choose View > Pear to display a magnified view of the pear.



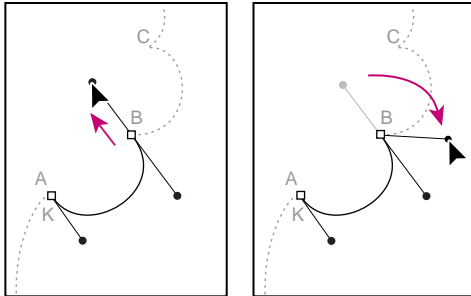
First, you'll draw the bite marks on the pear by creating corner points and changing the direction of the curve segments.

2 Select the pen tool (✎) from the same group as the convert-direction-point tool (↶). Drag the pen tool from point A on the template to the red dot to set the starting anchor point and direction of the first curve. Release the mouse.

3 Drag the pen tool from point B to the red dot—but don't release the mouse—and hold down Alt (Windows) or Option (Mac OS) and drag the direction handle from the red dot to the gold dot. Release the mouse.

4 Continue drawing to points C and D by first dragging from the anchor point to the red dot and then Alt/Option-dragging the direction handle from the red dot to the gold dot.

At the corner points B, C, and D, you first drag to continue the current segment, and then Alt/Option-drag to set the direction of the next curved segment.



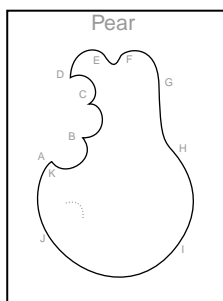
Dragging adjusts curve.

*Alt/Option-dragging
direction point sets
corner point.*

Next, you'll complete drawing the pear by creating smooth points.

5 Drag from each of the points E through J to their red dots and then click anchor point K to close the pear shape. Notice when you hold the pointer over anchor point K, there is a small open circle next to the pen indicating that the path will close when you click.

6 Hold down Ctrl (Windows) or Command (Mac OS) and click away from the path to deselect it, and choose File > Save.

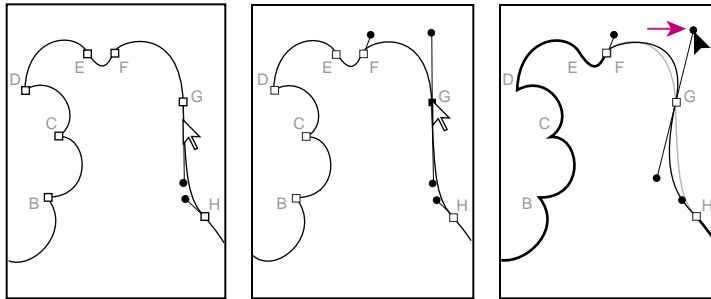


Editing curves

To adjust the curves you've drawn, you can drag the curve's anchor points or its direction lines. You can also edit a curve by moving the line.

1 Select the direct-selection tool (⌘) and click the outline of the pear.

Clicking with the direct-selection tool displays the curve's direction lines and lets you adjust the shape of individual curved segments. Clicking with the selection tool selects the entire path.



Using direct-selection tool selects individual segments.

Selecting anchor point

Adjusting anchor point

2 Click the anchor point G at the top right of the pear to select it, and adjust the segment by dragging the top direction handle as shown in the illustration.

3 Now select the pen tool (✎) and drag to draw the small curve on the pear where the arrow will pierce it. (Use the dashed line on the template as a guide.)

For tips on drawing curves and information about adding, deleting, and moving anchor points on a path, see Chapter 4, “Drawing,” in the *Adobe Illustrator 8.0 User Guide*.


Finishing the pear illustration

To complete the illustration, you'll assemble the objects together, paint them, and position parts of the arrow to create the illusion of the pear being pierced.

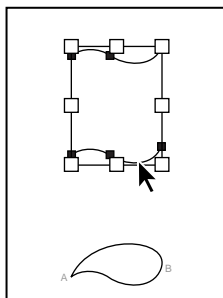
Assembling the parts

1 Double-click the hand tool (☞) to fit the artwork in the window.

2 Choose Window > Show Layers to display the Layers palette.

3 In the Layers palette, click the  icon (below the eye icon) that's next to the Template layer name to hide the template.

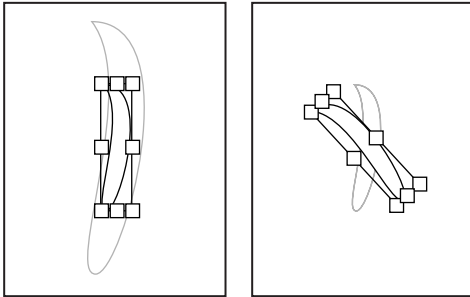
4 Select the selection tool (☛) in the toolbox and Shift-click to select the two single curved lines that you no longer need for the leaf. Press Backspace (Windows) or Delete (Mac OS) to delete them.



Now you'll make the stem and leaf smaller and rotate them slightly using the Transform commands.

5 Select the stem and choose **Object > Transform > Scale**. Enter **50%** in the Scale text box, select the Scale Stroke Weight option, and click OK.

6 Choose **Object > Transform > Rotate** and enter **45** degrees in the Angle text box, and click OK.



7 Select the leaf and choose **Object > Transform > Scale**. Leave the settings as they are and click OK to scale the leaf by 50 percent. Then choose **Object > Transform > Rotate** and enter **15** degrees in the Angle text box, and click OK.

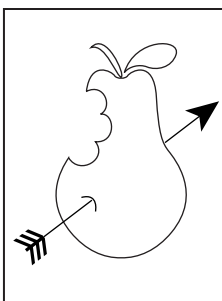
You can also scale and rotate objects using the scale and rotate tools or the free transform tool to do both. For information, see Chapter 6, “Modifying Shapes,” in the *Adobe Illustrator 8.0 User Guide*.

8 Move the stem and the leaf to the top of the pear.

9 Move the parts of the arrow over the pear to make it look like the arrow is entering the front of the pear and exiting out the back.

Objects are arranged in the order that they are created, with the most recent in front.

10 Select the bottom part of the arrow and choose **Object > Arrange > Bring to Front** to arrange it in front of the pear.



Painting the artwork

Now paint the objects as you like. We removed the stroke on the leaf, the stem, and the pear, and we painted the fills with custom-made gradients called “Pear leaf,” “Pear stem,” and “Pear body.” We painted the arrow with a dark blue color, and then we added some detail lines to the leaf, the stem, and the round part of the pear using the paintbrush tool and the pen tool.

- 1 Choose Window > Show Swatches to display the Swatches palette.
- 2 Select an object and then select a swatch in the Swatches palette to paint the object with a color, pattern, or gradient.

To learn how to create your own gradients, see Chapter 8, “Using Gradients, Blends, and Patterns,” in the *Adobe Illustrator 8.0 User Guide*. To learn more about painting options in Illustrator, see the “Painting” tutorial or see Chapter 7, “Working with Color,” in the *Adobe Illustrator 8.0 User Guide*.

- 3 In the Color palette, drag the None button up on top of the Stroke box to remove the stroke of a selected object and still leave the Fill box selected.

You’ve completed the lesson on drawing straight lines and curves. For additional practice with the pen tool, try tracing over images with it. As you practice more with the pen tool, you’ll become more adept at drawing the kinds of curves and shapes you want.

For more information on the drawing tools, see the movie “Drawing and Selecting” on the Adobe Illustrator Tour & Training CD and see Chapter 4, “Drawing,” of the *Adobe Illustrator 8.0 User Guide*.

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