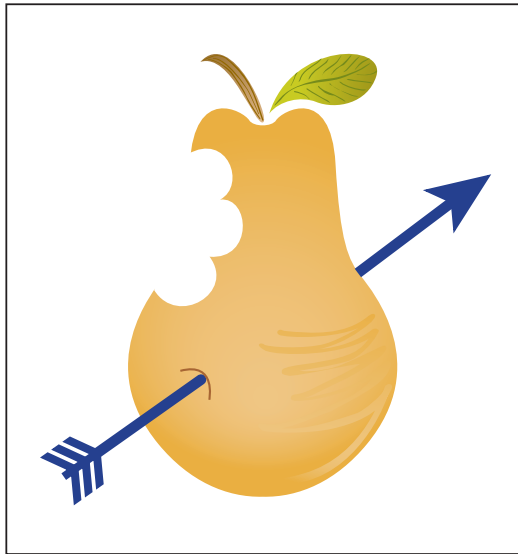


4 Drawing with the Pen tool



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 free from lines, the Pen tool is easier for drawing more precisely. You'll practice using the Pen tool on a blank artboard and then use the Pen tool to create an illustration of a pear.

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

- Draw straight lines
- Use Template layers
- End path segments and split lines.
- Draw curved lines.
- Select and adjust curve segments.
- Draw two types of curves, smooth and pointed.
- Edit curves, changing from smooth to pointed, and vice versa.

Getting started

The first part of this lesson involves manipulating the Pen tool on a blank artboard.

1 To ensure that the tools and palettes function exactly as described in this lesson, delete or deactivate (by renaming) the Adobe Illustrator CS preferences file. See “Restoring default preferences” on page 2.

2 Open the file named L4str_01.ai from the Lesson04 folder, located inside the Lessons folder within the AICIB folder on your hard drive. The top portion of the artboard shows the path that you will create. Use the bottom half of the page for this exercise.

3 Use Ctrl+0 or Command+0 (zero) to fit the entire page into the window and then close all the palettes, except for the tools, by clicking their close boxes or by holding down Shift and pressing Tab once. You won't need to use them for this lesson.

4 Select the Pen tool (🖋). Notice that when the pen has not yet placed its first point, an “x” appears to the right of the pen icon. This means you are starting a new path. Click and release once near the top of the page. Then, move the mouse away from the original anchor point, and the “x” no longer appears.

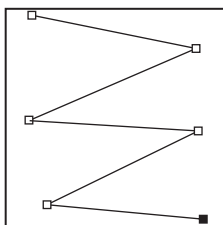
***Note:** If instead of the pen icon you see a crosshair, the caps lock key is active. Caps Lock On turns tool icons into crosshairs for greater precision use.*

5 Move the mouse to the right and click once to create the next anchor point in the path.


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

> *Undo, and click again. (Direction handles are used to reshapes curved paths, but do not print)*

The first point connects to the new anchor point. Click back under the initial anchor point to create a zigzag pattern. Your zigzag is complete when it has a total of six anchor points.



Click and release from point to point to create the zigzag.

Choose the Selection tool () . One of the many benefits of using the Pen tool is that you can create custom paths and continue to edit the anchor points that make up the path. You can learn more about the Selection tools by reviewing Lesson 2, “Basics of Selecting Objects ”; here you will see how the Selection tools relate to the Pen tool.

6 Using the Selection tool, click on the zigzag path and note how all the anchor points become solid, signifying that all anchor points are selected. Click and drag the path to a new location anywhere on the artboard and notice that all the anchor points travel together, maintaining the zigzag path.


7 Deselect the zigzag path any one of these four ways:

a Use the Selection tool and click on an empty section of the artboard.

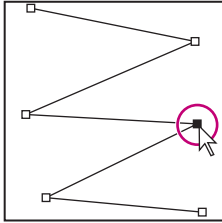
b Use Select > Deselect from the menu.

c While on the Pen tool, hold down the Ctrl (Windows) or Command (Mac OS) key and click to deselect; this temporarily gives you the Selection tool. When the Control or Command key is released, you return to the Pen tool.

d Click once on the Pen tool. Even though it looks like the path is still active, it will not connect to the next anchor point created.


8 Choose the Direct Selection tool () and click on any one point in the zigzag. Using the marquee selection technique with the Direct Selection tool can make selecting

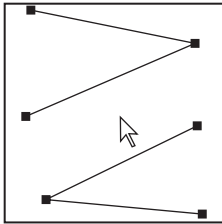
individual anchor points easier. The selected anchor point turns solid, while the rest are hollow.




Only the active point appears solid.

9 With the anchor point selected, click and drag. The anchor point is moving but the others are stationary. This is how you edit a path.

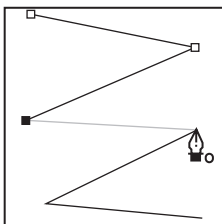
10 At times you will need to recreate just one line segment in a path. Choose Select > Deselect, then with the Direct Selection tool () , click on any line segment that is between two anchor points and choose Edit > Cut.



Select just a segment of a path.

11 Return to the Pen tool and position the pointer over one of the anchor points that was connected to the line segment. Note that the icon of the Pen has a forward slash () to the right of it, signifying a continuation of an existing path. Click and release the mouse.

12 Position the pointer over the other point that was connected to the original line segment. An icon of a circle (⦿) with a line through it appears. This signifies that you are reconnecting to another path.



Reconnect the paths.

13 File > Save and close this file.

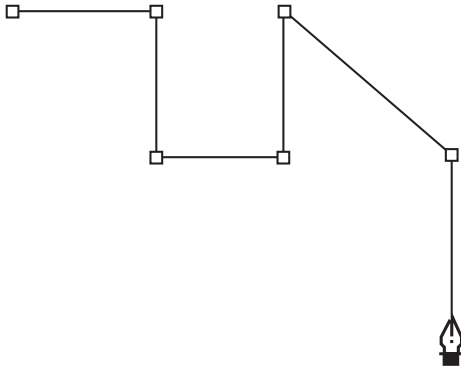
Creating straight lines

In Lesson 3 you discovered that using the Shift key in combination with shape tools constrains the shape of objects you create using Illustrator. This is also true with the Pen tool, except that the procedure constrains the paths you create in multiples of 45°.

In this part of the lesson, you will learn how to draw straight lines.

- 1** Open the file named L4str_02.ai from the Lesson04 folder, located inside the Lessons folder within the AICIB folder on your hard drive. The top portion of the artboard shows the path that you will create. Use the bottom half of the page for this exercise.
- 2** Select the Pen tool (⦿) and click once in the work area of the page.
- 3** Hold the Shift key down and click about an inch to the right of the original anchor point.

- 4 While holding down the Shift key, click with the mouse and try to replicate the path in the exercise file.



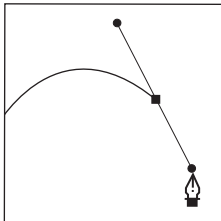
Hold down the Shift key while clicking to constrain the path.

- 5 File > Save and close the file.

Creating curved paths

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, curves with control points. By setting anchor points and dragging direction handles (controls) you can define the shape of the curve. Although drawing curves this way takes some getting used to, it gives you the greatest control and flexibility in creating paths.

- 1 Before we get started with a lesson file, choose File > New to create a new letter-sized document in Adobe Illustrator, leaving settings at the page defaults. Consider this page a “scratch” page to practice the Bézier curve.
- 2 Click and release the mouse anywhere on the page to create the initial anchor point. Then click in another location on the page (don't release the mouse), and drag creating a curved path.




Click and drag to create a curved path.

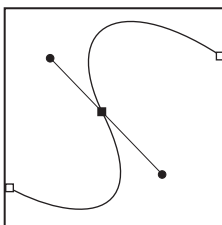
Continue clicking and dragging at various locations on the page. The goal for this exercise is not to create anything specific, but to get you accustomed to the feel of the Bézier curve.

Notice that as you click and drag, direction handles appear that end in round direction points. The angle and length of the direction handles determine the shape and size of the curved segments. Direction lines do not print and are not visible when the anchor is inactive.

3 Choose **Select > Deselect**.

4 Choose the Direct Selection tool () and select a curved segment to display the direction handles again. Moving the direction points reshapes the curves.

***Note:** 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.*

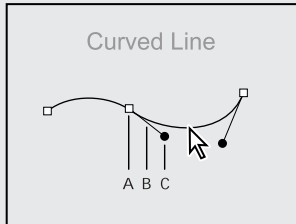


Select anchor points to access the direction handles.

4 Choose **File > Close** and do not save this file.

Components of a path

A smooth anchor point always has two direction handles that move together as a single, straight unit. When you drag the direction anchor point of either direction line on a smooth anchor point, both direction handles move simultaneously, maintaining a continuous curve at that anchor point.



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

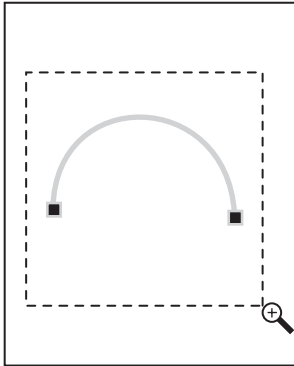
In comparison, a corner point can have two, one, or no direction handles, depending on whether it joins two, one, or no curved segments, respectively. Corner point direction handles maintain the corner by using different angles. When you drag a direction point on a corner point's direction line, the other direction line, if present, does not move.

Building a curve

In this part of the lesson, you will learn how to control the direction handles in order to control curves.

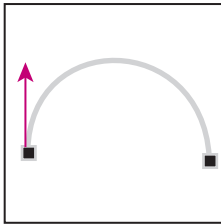
1 Open the file named L4str_03.ai from the Lesson04 folder. On this page you can see the paths that you will create. A template layer has been created in this file so that you can practice using the Pen tool by tracing. (See Lesson 7, "Working with Layers," for information about creating layers.) The work area below the path is for additional practice on your own.

- 2 Press Z to switch to the Zoom tool and drag a marquee around the first curve.



Zoom in to a specified area by dragging a marquee when on the Zoom tool.

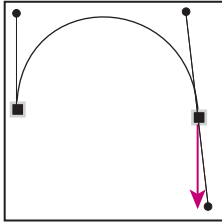
- 3 Select the Pen tool (☞) and click and hold at the base of the left side of the arch and drag up to create a direction line going the same direction as the arch. It helps to remember to always follow the direction of the curve. Release the mouse when the direction line is slightly above the arch.



When a curve goes up, the direction line should also go up.

Note: *The artboard may scroll as you drag the anchor point. If you lose visibility of the curve choose View > Zoom out until you see the curve and anchor point. Pressing the spacebar will temporarily give you the Hand tool and allow you to reposition the artwork.*

- 4 Click on the lower right base of the arch path and drag down. Release the mouse when the top direction line is slightly above the arch.



To Control the path pay attention to where the direction handles fall.

- 5 If the path you created is not aligned exactly with the template, return to the Direct Selection tool and select the anchor points one at a time. Then adjust the direction handles until your path follows the template more accurately.

***Note:** Pulling the direction handle longer makes a higher slope, while pulling it shorter makes the slope flatter.*

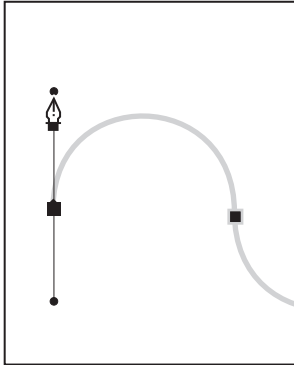
- 6 Save the file by choosing File > Save.

- 7 What you created is an open path; now you are going to create the second path on this page. If you click with the Pen tool while the original path is still active, the path will connect. To avoid doing this, use the Selection tool and click on the artboard anywhere there are no other objects, or choose Select > Deselect.

***Note:** You can also hold down the Ctrl (Windows) or Command (Mac OS) key to temporarily switch you to the selection tool. Hold down command and click on the artboard where there are no objects to deselect.*


- 8 Click and drag at the left base of path “B,” again in the direction of the arch. Click and drag down on the next square point, adjusting the arch with the direction handle

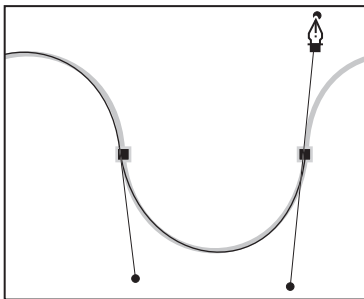
before you release the mouse. Don't worry if it is not exact; you can correct this with the Direct Selection tool (⌘) when the path is complete.



Click and drag up to create the upward arch.

Continue along the path, alternating between clicking and dragging up and down. Put anchor points only where you see the square boxes. 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.

 *You have the ability to undo multiple times in Adobe Illustrator. To set the minimum number of undos, choose Edit > Preferences > Units & Undo (Windows) or Illustrator > Preferences > Units & Undo (Mac OS).*



Alternate between dragging up and down with the Pen tool.

9 When the path is complete, choose the Direct Selection tool and select an anchor point. When the anchor is selected, the direction handles reappear and you can readjust the slope of the path.

10 Practice repeating these paths in the work area.

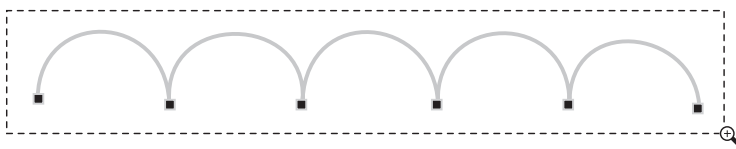
11 File > Save and close the file.

Curves and corner anchor points

When creating curves, the directional handles help to determine the slope of the path. Returning to a corner point requires a little extra effort. In this next portion of the lesson, we will practice converting curve points to corners.

1 Open the file named L4strt_04.ai from the Lesson04 folder. On this page you can see the path that you will create. Use the top section as a template for the exercise. Create your paths directly on top of those that you see on the page. The work area below is for additional practice on your own.

2 Use the Zoom tool and drag a marquee around the top path.

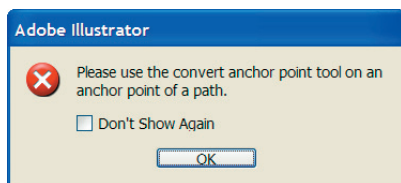


You will get a much more accurate path when you are zoomed in.

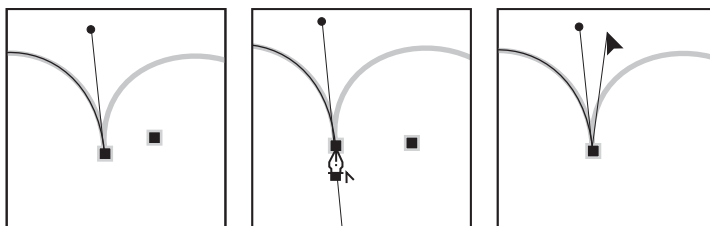
3 Choose the Pen tool (✎) and click on the first anchor point and drag up, then click on the second anchor point and drag down, just as you have been doing for previous exercises.

4 Hold down Alt (Windows) or Option (Mac OS) and position the mouse over either the last anchor point created or its direction handle. Look for the caret (^) symbol and click and drag up when it is visible.

An alert window will appear if you don't click exactly on the anchor point. If that happens click OK and try again.



This alert will appear if you do not click on the anchor point.

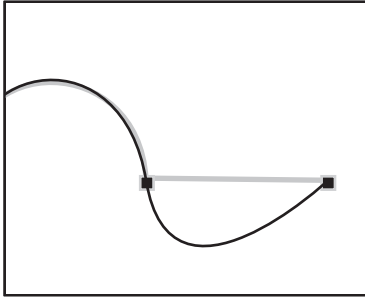


When the caret is visible, click and drag.

You can practice adjusting the direction handles with the Direct Selection tool () when the path is completed.

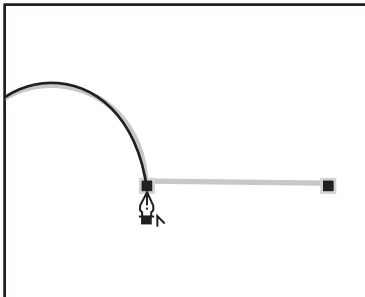
- 5** Release the Alt/Option key and click on the next square point on the template path and drag down.
- 6** Hold down the Alt/Option key again and grab the last anchor point or direction line and pull it up for the next curve. Remember, you must see the caret (^) or you will create an additional loop.
- 7** Continue this pattern of clicking and dragging and using the Alt/Option key to create corner points until the path is completed. Use the Direct Selection tool to fine-tune the path, and then deselect the path.
- 8** File > Save.
- 9** Choose View > Fit in Window. You can also use Ctrl+0 (zero) (Windows) or Command+0 (Mac OS). Use the Zoom tool to drag a marquee around the second path and enlarge its view.
- 10** With the Pen tool, click on the first anchor point and drag up, then click and drag down on the second anchor point. This motion of creating an arch should be familiar to

you by now. You will now go from the curve to a straight line. Simply pressing Shift and clicking will not produce a straight line, since this last point is a curved anchor point.



The path when a curved point is not turned into a corner point.

11 To create the next path as a straight line, click on the last point created. Then hold down the Shift key and click to the next point.





Click on the last anchor point created to force a straight path from it.

- 12** For the next arch, click and drag down (since the arch is going down).
- 13** Click on the next point and drag up to complete the downward arch.
- 14** Click and release on the last anchor point of the arch.
- 15** Shift+click to the last point.
- 16** Click and drag up and then click and drag down on the last point to create the final arch.
- 17** Practice repeating these paths in the lower portion.
- 18** File > Close the file.

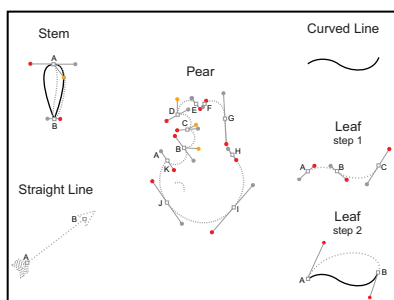
Creating the pear illustration

In this next part of the lesson, you'll create an illustration of a pear pierced by an arrow. This procedure will incorporate what you have learned in the previous exercises as well as teach you some additional pen techniques.

- 1 Choose File > Open, and open the L4end.ai file in the Lesson04 folder, located inside the Lessons folder within the AICIB folder on your hard drive.
- 2 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.
-  For an illustration of the finished artwork in this lesson, see the color section of this manual.

Now open the start file to begin the lesson.

- 3 Choose File > Open, and open the L4start.ai file in the Lesson04 folder.




- 3 Choose File > Save As, name the file **Pear.ai**, and select the Lesson04 folder in the Save In menu. Leave the type of format set to Adobe Illustrator® Document, and click Save. In the Illustrator Options palette, leave the options set at the defaults and click OK.


Creating the arrow

You'll begin by drawing the straight line for the arrow. The template layer allows you to follow along directly over the artwork.

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

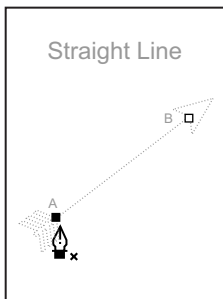
Separate views that show different areas of the template at a higher magnification were created for this document and added to the View menu.

 To create a custom view, choose View > New View. For information, see “Viewing Artwork” in online Help.

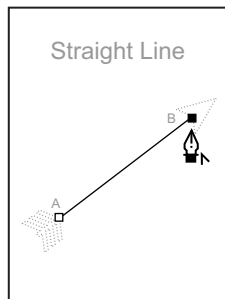
- 2 Choose View > Hide Bounding Box to hide the bounding boxes of selected objects. Selecting the Pen tool () in the toolbox, move the pointer to the dashed line of the arrow in the artwork. Notice that the Pen tool pointer has a small “x” next to it. If you recall, this indicates that clicking will 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.

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 caret (^) appears next to the Pen tool. The caret 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 caret disappears when you move the Pen tool away from the anchor point.


- 4 Remember that you must end the path before you can draw other lines that aren't connected to this path. Choose Select > Deselect, or use any of the other methods discussed in the previous exercises.

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

- 5 With the Selection tool () from the toolbox, click the straight line to select it.
- 6 Choose Window > Stroke to display the Stroke palette.
- 7 In the Stroke palette, type **3 pt** in the Weight text box and press Enter or Return to apply the change.


Splitting a path

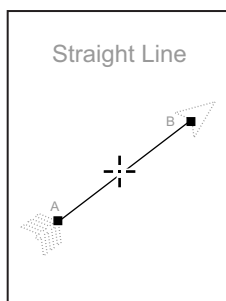
To continue creating the arrow for this illustration, you'll split the path of the straight line using the Scissors tool and adjust the segments.

- 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.

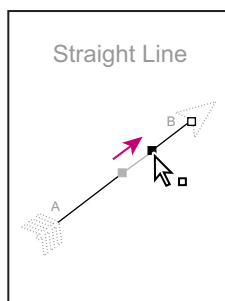
Cuts made with the Scissors tool must be on a line or a curve rather than on an endpoint.

Where you click with the Scissors tool, you will see a newly selected anchor point. The scissors tool actually creates two anchor points each time you click, but 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. Select 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.

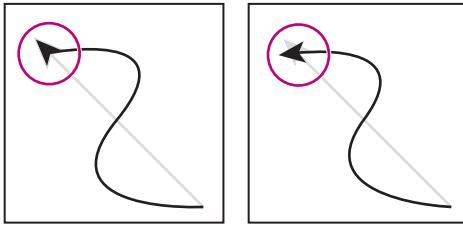


Drag to separate the new line segments.

Adding arrowheads

Adobe Illustrator lets you add pre-made arrowheads and tails to open paths by applying an Effect. The Add Arrowhead feature is available under the Filter menu as well as the Effect menu. The benefit to using an Effect is that the arrow dynamically changes with the stroke that it was created on. A filter, on the other hand, has no relationship to the stroke.

When a path with the Add Arrowhead Effect is changed the arrow head follows the path, whereas the Filter arrowhead remains in its created position. Read more about effects and how to use them in Lesson 10.



The Add Arrowhead Filter.

The Add Arrowhead Effect.


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 > Effect > Stylize > Add Arrowheads**.

Note: Choose the top, or first, **Effect > Stylize** command. The second **Effect > Stylize** command applies painted or impressionistic effects to bitmap images.

2 In the Add Arrowheads dialog box, leave the Start section set to **None**. For the End section, click an arrow button to select the number **2** style of arrowhead (a thumbnail preview appears in the dialog box), 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 **Effect > Stylize > Add Arrowheads** to open the dialog box again. Select the number **18** style of arrowhead from the Start section, select **None** for the End section, 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 **Effect > Stylize > Add Arrowheads**.

- 4 Choose **Select > Deselect** to deselect the artwork, and then choose **File > Save**.

Drawing curves

In this part of the lesson, you will review drawing curves by drawing the pear, its stem, and a leaf. You'll examine a single curve and then draw 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 handles, which extend from the points. The **Direct Selection tool** lets you select and edit individual segments in the curved line.

By selecting a curve, you also select the paint attributes of the curve, so that the next line you draw will have those same attributes. For more on paint attributes, see Lesson 5, “Painting.”

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 will drag it to set the starting point and the direction of the line's curve. When you release the mouse button, the starting point is created and two direction handles are formed. Then you drag the Pen tool to the end of the first curve and to set the starting point and direction of the next curve on the line.

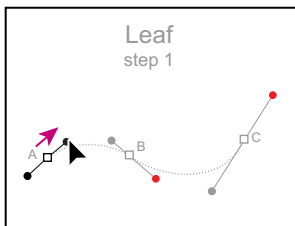
- 2 Select the Pen tool (🖋) and position it over point A on the template. Press the mouse button and drag from point A to the red dot. Then release the mouse button.

Next you'll set the second anchor point and its direction handles.

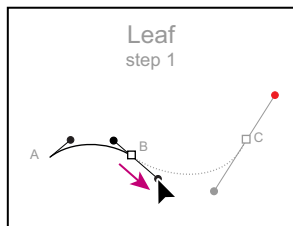
- 3 Press the mouse button and drag from point B to the next red dot. Release the mouse button. Illustrator connects the two anchor points with a curve that follows the direction handles you have created. Notice that if you vary the angle of dragging, you change the amount of curve.

- 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 button.

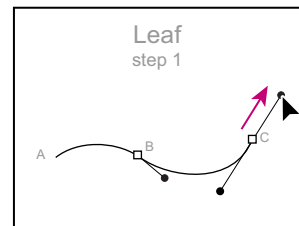
- 5 Control-click (Windows) or Command-click (Mac OS) away from the line to indicate the end of the path. (You must do this to indicate when you have finished drawing a path. You can also do this by clicking the Pen tool in the toolbox, or by choosing Select > Deselect.)



Drag to start the line and set direction of first curve.



Drag to end first curve and set direction of second curve.



Drag to end second curve and adjust its direction.

Drawing different kinds of curves

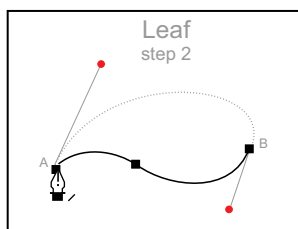
Now you'll finish drawing the leaf by adding to an existing curved segment. Even after ending a path, you can return to the curve and add to it. The Alt (Windows) or Option (Mac OS) key lets you control the type of curve you draw.

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

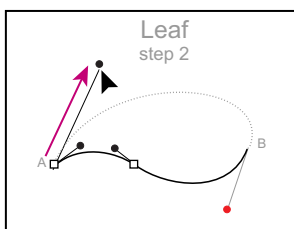
You'll add a corner point to the path. A corner point lets you change the direction of the curve. A smooth point lets you draw a continuous curve.

- 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 existing 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 anchor point A to the red dot. Then release the mouse button.



A slash indicates Pen tool is aligned with anchor.

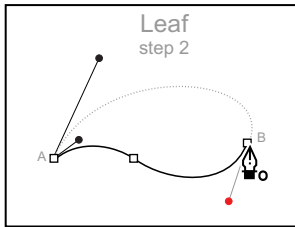


Alt/Option-dragging creates corner point.

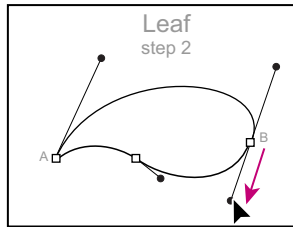
So far, all the curves you have drawn have been open paths. Now you'll draw a closed path, in which the final anchor point is drawn on the first anchor point of the path. (Examples of closed paths include ovals and rectangles.) You'll close the path using a smooth point.

- 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 button and drag from this point to the second red dot.

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



A small circle indicates clicking with Pen tool closes the path.




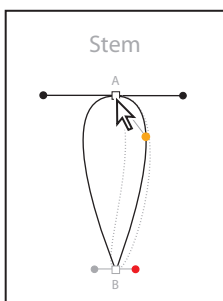
Drag to red dot to lengthen curved line.

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

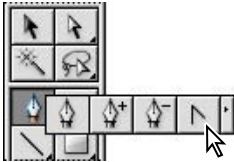
Changing a smooth curve to a corner and vice versa

Now you'll create the leaf stem by adjusting a curved path. You'll be converting 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 red direction handles for the smooth point.

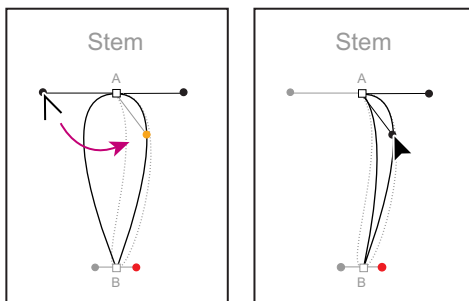


- 3** Select the Convert Anchor Point tool (⌘) from the same group as the Pen tool in the toolbox, or use the shortcut for Convert Anchor Point tool by pressing Alt (Windows) or Option (Mac OS).



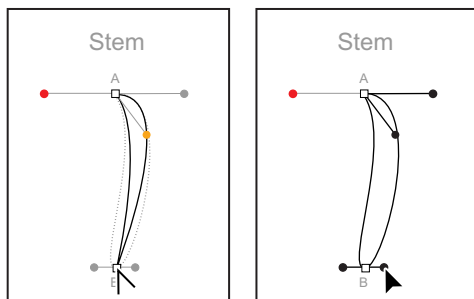
- 4** Using the Convert Anchor Point tool, select the left direction point (on top of the red dot) on the direction line, drag it to the gold dot on the template, and then release the mouse button.

Dragging with the Convert Anchor Point tool converts the smooth anchor point to a corner point and adjusts the angle of the left direction line.



Use Convert Anchor Point tool to convert curves to corners.

- 5** Using the Convert Anchor Point tool, select 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 button.



Use Convert Anchor Point tool to convert corners to curves.

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

When using the Convert Anchor Point tool, keep these guidelines in mind:

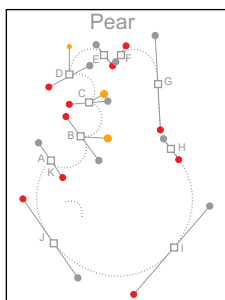
- Drag from the curve's anchor point for a smooth point and continuous curve.
- Click the curve's anchor point or drag a handle (direction point) of the curve for a corner point on a discontinuous curve.

6 Choose File > Save.

Drawing the pear shape

Now you'll draw a single, continuous object that consists of smooth points and corner points. Each time you want to change the direction of a curve at a specific 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.



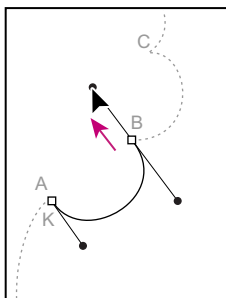
First you'll draw the bite marks on the pear by creating corner points and changing the direction of the curve segments.

2 Select the Pen tool (🖋) from the same group as the Convert Anchor 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 button.

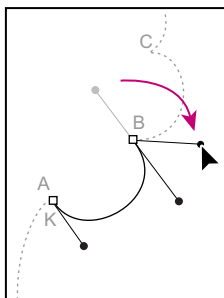
3 Drag the Pen tool from point B to the red dot—but don't release the mouse button—and, while holding down Alt (Windows) or Option (Mac OS), drag the direction handle from the red dot to the gold dot. Release the mouse button.

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.



Drag to adjust curve.




Alt/Option-drag direction point to set corner point.

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

- 5 Drag each of the points from E through J to their red dots, and then click anchor point K to close the pear shape. Notice that when you hold the pointer over anchor point K, a small open circle appears next to the pen, indicating that the path will close when you click.
- 6 Hold down Control (Windows) or Command (Mac OS) and click away from the path to deselect it, and then choose File > Save.

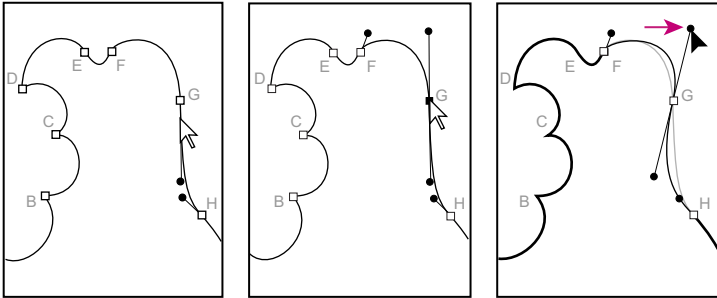
Editing curves

To adjust the curves you've drawn, you can drag either the curve's anchor points or its direction handles. 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 handles and lets you adjust the shape of individual curved segments. Clicking with the Selection tool selects the entire path.

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.



Use Direct Selection tool to select individual segments.

Select anchor point.

Adjust anchor point.

3 In the toolbox, click to select the Fill box. Then click the None box to change the Fill to None.

4 Now select the Pen tool (☞) and drag to draw the small curve on the pear where the arrow pierces it. (Use the dashed line on the template as a guide.)

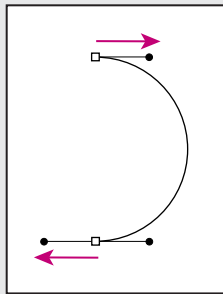
Note: If you can't see the dashed, curved line on the template, make sure that the Fill in the toolbox is set to None and that the Stroke is set to black.

5 Choose File > Save.

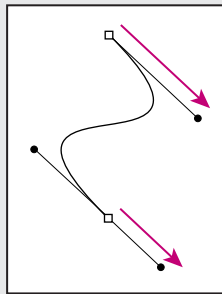
Tips for drawing curves

Keep the following guidelines in mind to help you draw any kind of curve quickly and easily:

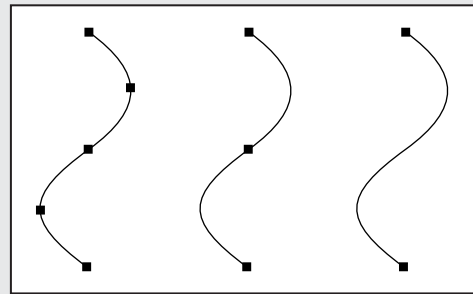
- Always drag the first direction point in the direction of the bump of the curve, and drag the second direction point in the opposite direction to create a single curve. Dragging both direction points in the same direction creates an S curve.
- When drawing a series of continuous curves, draw one curve at a time, placing anchor points at the beginning and end of each curve, not at the tip of the curve.
- Use as few anchor points as possible, placing them as far apart as possible.




Drag in opposite direction to create a smooth curve.



Drag in same direction to create an S curve.





Less to more-efficient curves.

 For information on adding, deleting, and moving anchor points on a path, see “About Drawing” in online Help.

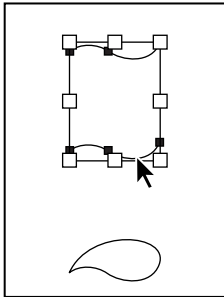
Finishing the pear illustration

To complete the illustration, you’ll make some minor modifications and assemble and paint all the objects. Then position parts of the arrow to create the illusion of the pear being pierced.

Assembling the parts

- 1 Double-click the zoom tool () to zoom to 100%.
- 2 Choose Window > Layers to display the palette.
- 3 In the Layers palette, click the template icon () that’s next to the Template layer name to hide the template.

- 4** Choose View > Show Bounding Box so that you can see the bounding boxes of selected objects as you transform them.
- 5** 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.



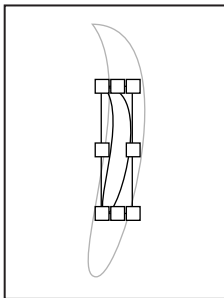
Select and delete extra lines.

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

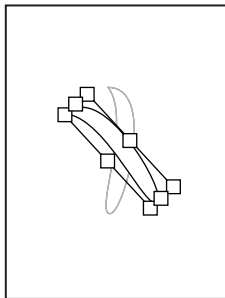
- 6** Select the stem and choose Object > Transform > Scale. Select Uniform and enter **50%** in the Scale text box. Select the Scale Strokes & Effects Option, and click OK.

The Scale Strokes & Effects Option scales stroke weights and effects automatically. You can also set this Option as a preference (choose Edit > General > Preferences).

- 7** Choose Object > Transform > Rotate. Enter **45** in the Angle text box, and click OK.



Scale stem 50%.



Rotate stem 45°.

Now you'll repeat the scaling and rotation on the leaf.

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

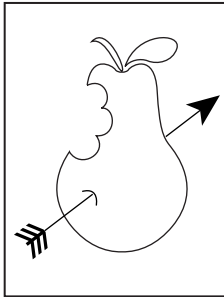
You can also scale and rotate objects by using the scale and rotate tools, respectively, or by using the free transform tool to do either. For information, see Lesson 6, “Transforming Objects.”

9 Select the selection pointer, and move the stem and the leaf to the top of the pear.

10 Move the parts of the arrow over the pear to make it look as if the arrow is entering the front of the pear and exiting the back.

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

11 Select the bottom part of the arrow, and Shift-click to select the curve where the arrow pierces the pear. Then choose Object > Arrange > Bring to Front to arrange them in front of the pear.



Painting the artwork

Now paint the objects as you like. In our color illustration, we have removed the stroke on the leaf, the stem, and the pear, and we’ve painted the fills with custom-made gradients called Pear leaf, Pear stem, and Pear body, which are provided in the Swatches palette. 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. We also stroked the curve where the arrow pierces the pear.

1 Choose Window > 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 Lesson 12, “Blending Shapes and Colors.” To learn more about painting options in Illustrator, see Lesson 5, “Painting,” and Lesson 15, “Creating Airbrush Effects.”

3 In the Color palette, drag the None icon up and drop it on the Stroke box to remove the stroke of a selected object.


4 Choose File > Save to save your work, then File > Close to close the file.

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.

Exploring on your own


Now that you’ve used the Pen tool to draw a pear with precise Bézier curves, try drawing the pear using the Pencil tool to create a hand-drawn look. You can edit lines that you draw using the Pencil tool to change their shape, and you can use the Smooth tool and Erase tool to edit the drawing further.

1 Open the L4start.ai file again, and save it as **Pear2.ai**.

2 Select the Pencil tool () in the toolbox, and draw the pear in one continuous line without releasing the mouse button. To close the path, hold down Alt (Windows) or Option (Mac OS)—a small circle will appear on the pointer—and continue dragging to draw the end of the line connected to the starting point.

Anchor points are set down as you draw with the Pencil tool, and you can adjust them once the path is complete. The number of anchor points is determined by the length and complexity of the path and by the tolerance values set in the Pencil tool Preferences dialog box. (Double-click the tool to display its preferences dialog box.)

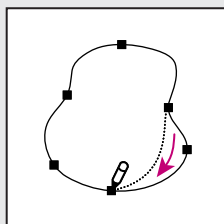
***Note:** You can draw and edit brushed paths with the paintbrush tool by using the same methods as those used for paths drawn with the Pencil tool. (See Lesson 5, “Working with Brushes.”)*

3 Use the Pencil tool () to edit the shape of the pear by redrawing segments on the path.

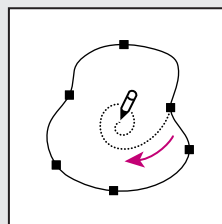
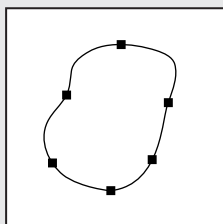
Changing a path with the Pencil tool

If the path you want to change is not selected, select it with the Selection tool. Or Control-click (Windows) or Command-click (Mac OS) the path to select it.

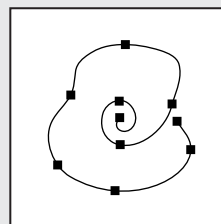
Position the Pencil tool on or near the path to redraw, and drag the tool until the path is the desired shape.



Using the Pencil tool to edit a closed shape.





Using the Pencil tool to create an open shape.



Depending on where you begin to redraw the path and in which direction you drag, you may get unexpected results. For example, you may unintentionally change a closed path to an open path, change an open path to a closed path, or lose a portion of a shape.

—From "Adjusting Paths" in online Help.



- 4 Use the Smooth tool () , in the same group as the Pencil tool () in the toolbox, to round out the shape of a curved segment (deleting anchor points if necessary).

The number of anchor points is determined by the length and complexity of the new path, as well as by the tolerance values set in the Smooth tool Preferences dialog box.

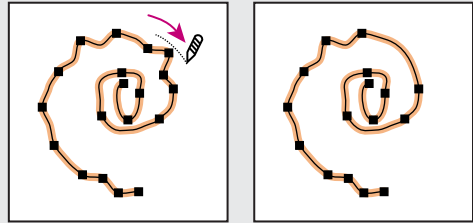
Smoothing the path with the Smooth tool

The Smooth tool lets you smooth out an existing stroke or section of a path. The Smooth tool retains the original shape of the path as much as possible.

To use the Smooth tool:

1. If the path you wish to smooth is not selected, select it with the Selection tool. Or Ctrl-click (Windows) or Command-click (Mac OS) the path to select it.
2. Do one of the following:
 - Select the Smooth tool () , located in the same group as the Pencil tool () in the toolbox.
 - When the pencil or paintbrush tool is selected, hold down Alt (Windows) or Option (Mac OS) to change the pencil to the Smooth tool.
3. Drag the tool along the length of the path segment you want to smooth out. The modified stroke or path may have fewer anchor points than the original.
4. Continue smoothing until the stroke or path is the desired smoothness.

–From “Adjusting Paths” on online Help.

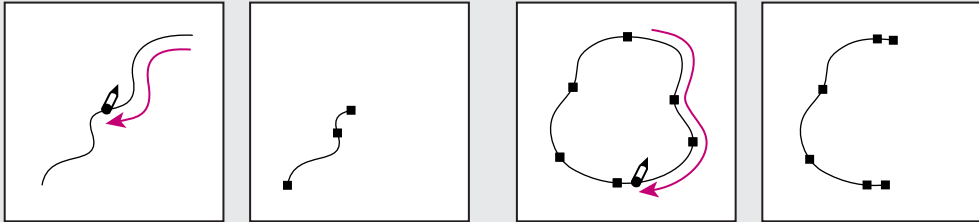


Stroke before and after using the Smooth tool.

- 5 Use the Erase tool (), in the same group as the Pencil tool () in the toolbox, to erase segments on the path of the pear, then redraw them using the Pencil tool ().

Erasing the path with the Erase tool

The Erase tool lets you remove a portion of an existing path or stroke. You can use the Erase tool on paths (including brushed paths), but not on text or meshes.



Strokes before and after using the Erase tool.

To use the Erase tool:

1. Select the Erase tool (✂), in the same group as the Pencil tool (P) in the toolbox.
2. Drag the tool along the length of the path segment you want to erase (not across the path). For best results, use a single, smooth, dragging motion.




Anchor points are added to the ends of the new paths.

—From “Adjusting Paths” on online Help.

Review questions

- 1 Describe how to draw straight vertical, horizontal, or diagonal lines using the Pen tool.
- 2 How do you draw a curved line using the Pen tool?
- 3 How do you draw a corner point on a curved line?
- 4 How do you change a smooth point on a curve to a corner point?
- 5 Which tool would you use to edit a segment on a curved line?

Review answers

- 1** To draw a straight line, you click twice with the Pen tool—the first click sets the starting anchor point, and the second click sets the ending anchor point of the line. To constrain the straight line vertically, horizontally, or along a 45° diagonal, hold down Shift as you click with the Pen tool.
- 2** To draw a curved line using the Pen tool, you hold down the mouse button and drag to create the starting anchor point and set the direction of the curve, and then you click to end the curve.
- 3** To draw a corner point on a curved line, hold down Alt (Windows) or Option (Mac OS) and drag the direction handle on the endpoint of the curve to change the direction of the path, and then continue dragging to draw the next curved segment on the path.
- 4** Use the Direct Selection tool () to select the anchor point, and then use the Convert Anchor Point tool () to drag a direction handle to change the direction.
- 5** To edit a segment on a curved line, select the Direct Selection tool () and drag the segment to move it, or drag a direction handle on an anchor point to adjust the length and shape of the segment.