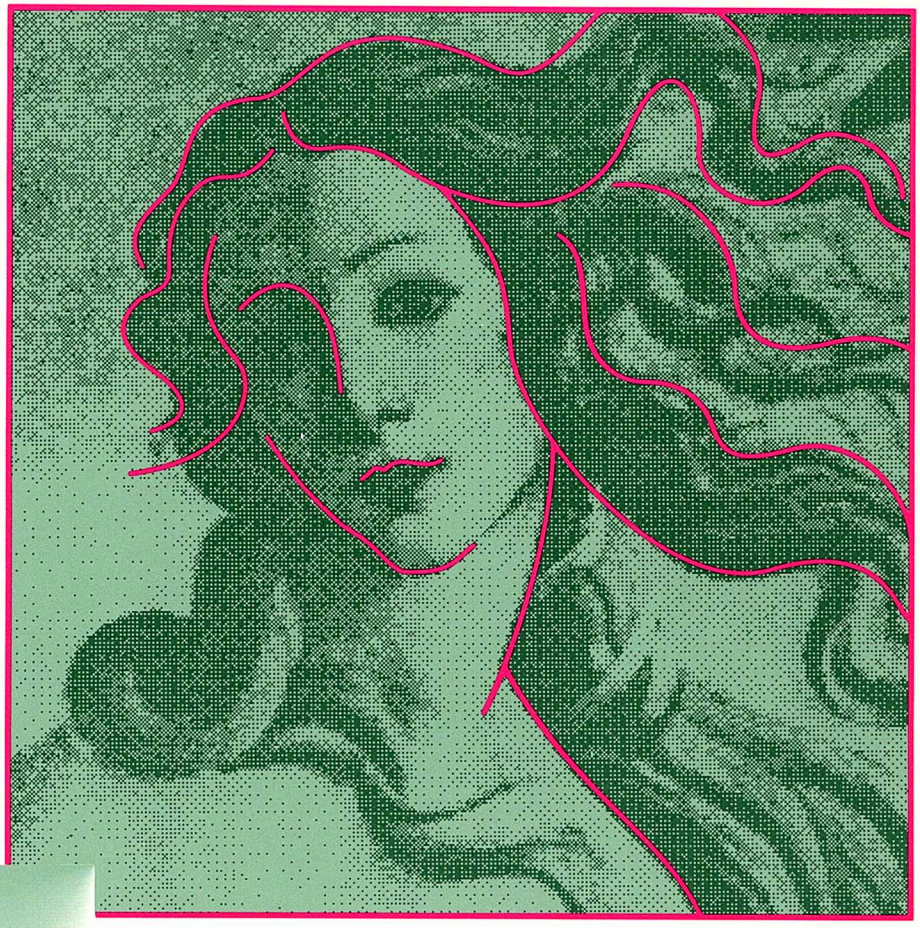


TUTORIAL

Adobe Illustrator 88™

V 1.9.3

Tutorial

Adobe Illustrator 88™

Part No: Tutorial Manual ACO6005

Table of Contents

The Adobe Illustrator 88 Tutorial

Welcome to the Adobe Illustrator 88™ program—the most powerful and sophisticated software drawing package ever developed. The *Adobe Illustrator 88 Tutorial* is a series of lessons designed to give you hands-on practice in learning the program. See the *Adobe Illustrator 88 User Guide* for reference information, and refer to the *Adobe Illustrator 88 Color Guide* to learn the specifics of using color with the program.

Learning to use the Adobe Illustrator 88 program

The Adobe Illustrator 88 program provides powerful electronic tools that are similar to the ones you now use to create illustrations. This tutorial contains exercises with step-by-step instructions to help you learn to use these tools.

Learning the program involves mastering these five general areas:

How to draw paths with the tools

You begin drawing by creating lines called paths. The *path* is the basic element of an Adobe Illustrator 88 drawing. A path can be a single line or a curve, a combination of lines and curves, a square or a circle, or an irregular shape. You use the freehand tool like a pencil to sketch irregular shapes. The pen tool creates smooth lines, as if you were drawing against a straightedge or a French curve.

Learning to create paths is the heart of learning the Adobe Illustrator 88 program. Once you have drawn a path, you use the program to add shading to the path, resize it, copy and paste, and modify it in an infinite variety of ways—without redrawing it. Lessons 1 through 5 explain how to draw paths. Lesson 10 shows you how to use the auto trace tool to create paths automatically when you use certain kinds of templates.

How to add shading and stroking

To paint a path, you fill an object with shades of gray or color or stroke a line to give it a specified weight. Filling and stroking are done in a dialog box, and you can try a variety of combinations without having to redraw anything. Lessons 1 and 2 include information on painting.

How to layer paths

The program creates the paths you draw in opaque layers, one on top of the other. Paths are layered in the order in which you create them. The program provides commands that help you rearrange things electronically any way you want. Lesson 6 explains paint layering.

How to use type

You enter type in a dialog box, where you can specify font, size, alignment, spacing, and leading. Lesson 7 shows you how to work with type.

How to transform paths to obtain special effects

Once you learn to create paths, you can begin to use the real power of the Adobe Illustrator 88 program. Unlike pencil and paper drawings, the objects you create with the Adobe Illustrator 88 program can be modified with a few keystrokes or the click of a mouse button. A path can be scaled to twice its size or half its size. You can rotate an object around an axis and make as many copies as you want, or you can reflect it across an axis or skew it for special effects. You can even generate intermediate shapes or shades between two objects. Lesson 8 describes the transformation tools and how to use them. Techniques for working with masking paths are included in Lesson 9.

Before you begin the Adobe Illustrator 88 Tutorial

Before you begin doing the lessons in this tutorial, you should do the following things:

1. Watch the videotape for a demonstration of the Adobe Illustrator 88 program. The videotape does not require that you use your Macintosh® computer.
2. Set up your disks.

   Copy the Adobe Illustrator 88 program and the Tutorial Folder onto your hard disk. If you do not have a hard disk, be sure to make backup copies of the disks before you use them. The Adobe Illustrator 88 program requires Apple® System 4.2 or later. Apple System Software is not provided with the program.

   TIP: If you are using a Macintosh that has 1 megabyte of memory or less, you should turn off the RAM cache in the Apple Control Panel. Turning off the RAM cache increases the amount of memory available to the Adobe Illustrator 88 program. Restart the computer after you turn off the RAM cache.

3. Learn Macintosh basics.

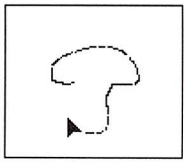
   If you are new to the Macintosh, review your Macintosh owner's guide. You should be familiar with such terms as, *click, double-click, drag,* and *select* before you begin using the Adobe Illustrator 88 program.

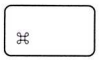
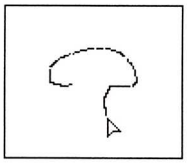
Lesson 1: *Drawing with the Freehand Tool*

Overview

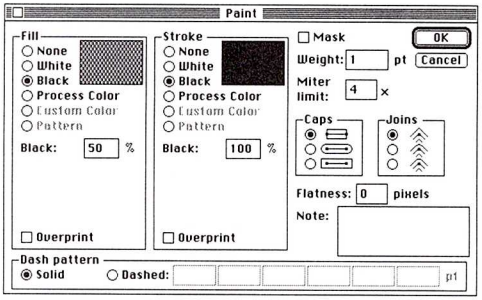
Drawing with the Freehand tool

1. Select 

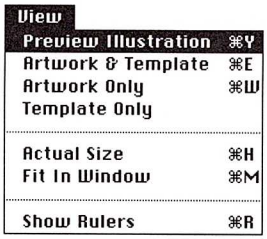
2. Drag 

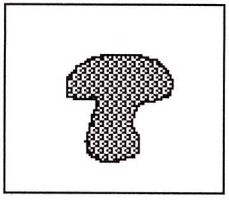
3. Erase 


4. Choose



5. View





Also in this lesson:

- Painting (filling and stroking)
- Previewing

Drawing with the Freehand Tool

Drawing with the Adobe Illustrator 88 program involves two processes. First, you create a *path*, which consists of lines or curves. Next, you perform actions on the path. You can assign attributes (fill it with a gray shade, for example), transform it (rotate it or make it bigger or smaller), edit it, or otherwise manipulate it.

In this lesson, you will learn how to use the freehand tool to create paths, and you will use the Paint command to fill and stroke those paths.

Start the Adobe Illustrator 88 program


Adobe Illustrator 88™

1. Double-click on the Adobe Illustrator 88 icon to start the program. (Double-click on the application name if your disk contents are not listed by icon.)

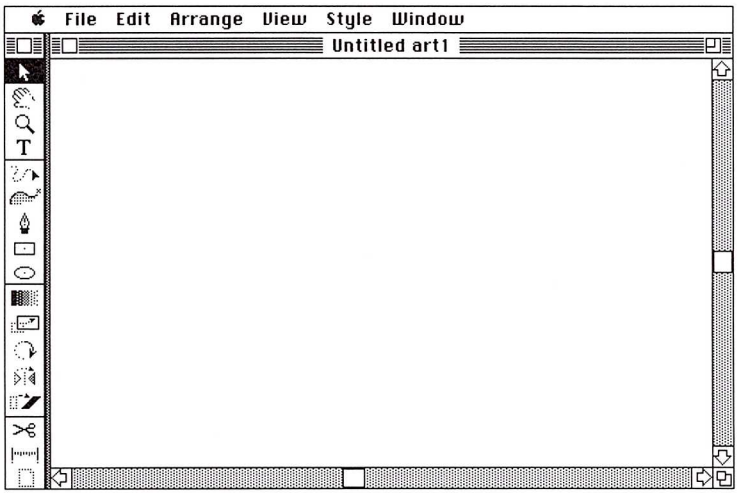
   If you have not personalized your copy of the program, you will be asked to type your name and company name.

2. Choose New from the File menu.

   Sometimes when you want to draw, you will be working with a template, a gray image over which you can trace. In this lesson, you will draw without a template. When the dialog box appears asking you for a template,

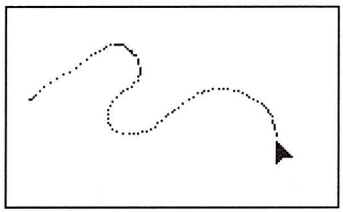
3. Click None.

   You will see the toolbox along the left side of the screen. The window is your drawing area.



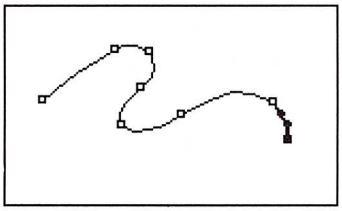
Create a path

1. Click on the freehand tool in the toolbox.
2. Move the pointer to the drawing area. The pointer becomes an x.
3. Hold down the mouse button and drag to draw a short, curved line similar to the one shown.



4. Release the mouse button.

   When you held down the mouse button with the freehand tool selected, the pointer became an arrowhead, and a dotted line showed where your path would appear. In general, the faster you drag, the farther apart the dots in the line are. When you released the mouse button, the watch appeared while the program constructed a path to match your drawing.

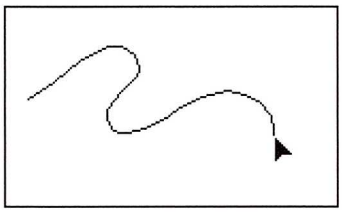


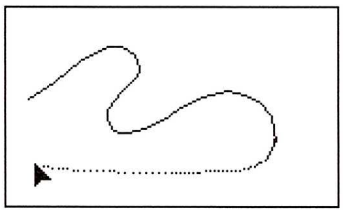
When the watch disappeared, a solid line replaced the dotted one. The program also created *anchor points* (indicated by squares) and *direction lines* (lines with a circle at the end of them). The Adobe Illustrator 88 program generates curves and lines by connecting anchor points. When you draw with the freehand tool, the program places these anchor points for you. When you draw with the pen tool, you place the anchor points yourself. You will learn more about anchor points and direction lines in later lessons.

Extend the path

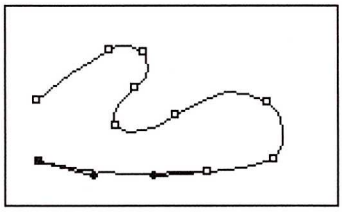
Once you have created a path, you can add to it by beginning to draw on the last anchor point. Anchor points at the beginning and the end of a path are called *endpoints*.

1. Position the pointer over the anchor point (indicated by the solid square) at the end of the path. Be sure the freehand tool is still selected.
2. Hold down the mouse button and drag to extend the line.





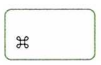
3. Release the mouse button.

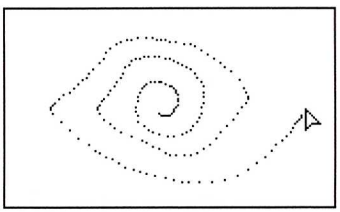


Adjust a path while drawing

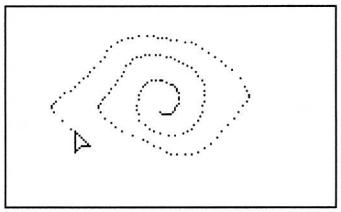
Sometimes you will want to adjust the path you are drawing. You can erase the path and redraw it *as long as you continue to hold down the mouse button,* before the program creates the path and the anchor points.

1. Hold down the mouse button and drag to create a path. *Do not* release the mouse button.
2. Still holding down the mouse button, press the ⌘ key. The arrowhead becomes hollow.

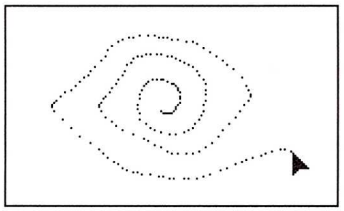




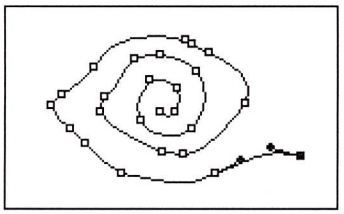
3. Move the pointer back over the dotted line you have just drawn. The dotted line you traced is erased. *Do not* release the mouse button.



4. Still holding down the mouse button, release the ⌘ key.
5. Drag to redraw the path.



6. Release the mouse button.



Create a closed path

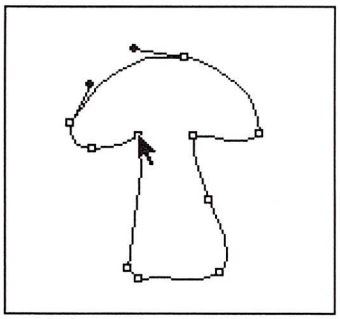
The paths you have drawn so far have been open paths. An *open path* is one that has a distinct beginning and end. *Closed paths* are loops and have no endpoints.

First, erase everything on your screen.

1. Choose Select All from the Edit menu.
2. Choose Cut from the Edit menu or press the Backspace key (the Delete key on some keyboards).
3. Position the pointer in the drawing area.

   The freehand tool should still be selected.

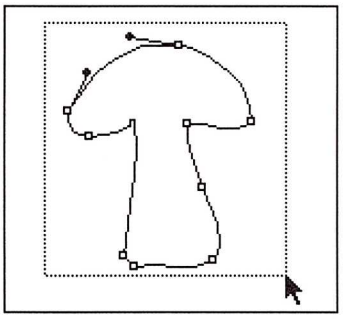
4. Hold down the mouse button and drag to draw a mushroom shape. (If you want to adjust the path, hold down the ⌘ key, retrace the dotted line to erase it, release the ⌘ key, and then continue drawing.)
5. Continue to drag until you have completed the entire shape. When you have positioned the pointer over the beginning of the line, release the mouse button.



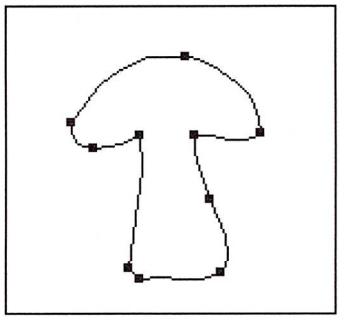
Fill and stroke the path

As you do in all Macintosh applications, you must first select the object you want to work on.

1. Click on the selection tool (the arrow) in the toolbox.
2. Move the pointer to the drawing area to a point above and to the left of the mushroom.
3. Hold down the mouse button and drag downward and to the right. As you drag, the selection marquee (the dotted rectangle) appears. Drag until the marquee surrounds the entire drawing.

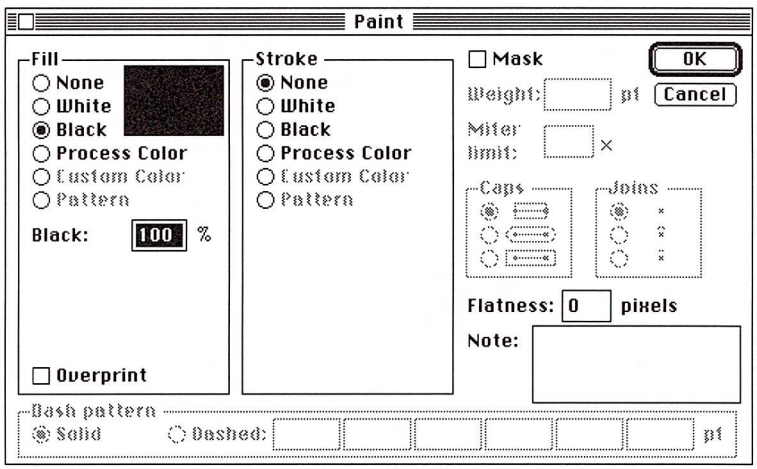


When you release the mouse button, the anchor points become solid squares, which indicates that they are selected.



4. Choose Paint from the Style menu.

   The Paint dialog box appears. A *dialog box* is a window into which you type values or indicate choices by clicking with the mouse button. This dialog box lets you add different kinds of attributes to paths.



   In this lesson, you will add shading to the interior of the mushroom by filling the path. You will also outline the mushroom by stroking the path and giving the line a specified weight, or thickness.

5. In the Fill options, click Black. (This option may already be selected.) The current Black value is highlighted in the Fill options list.

6. Type 50.

7. Move the pointer to the Stroke options, and click Black. The preset value of 100 is shown. If this value is not 100, type 100.

   When you clicked Black in the Stroke options, the Weight field became active. This field indicates line width in points. The current value is shown next to Weight.

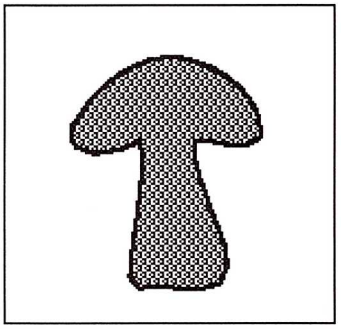
8. Move the pointer to the Weight field. Double-click to highlight the current value, and replace it with a new value by typing 2.

9. Click OK.

Preview the drawing

When you draw paths, you are creating what is called artwork. *Artwork* consists only of lines that represent the paths that you draw. It does not show any attributes you have assigned to the paths. To see the attributes, you must preview the document. Preview mode displays on your screen what you will get when you print.

1. Choose Preview Illustration from the View menu. Your screen should look something like this:



You can see the results of the options you chose in the Paint dialog box. You have created a path that is stroked with a 2-point line weight and filled with a 50 percent gray shade.

NOTE: You cannot edit your artwork when you are in preview mode.

2. Choose Artwork Only from the View menu. The artwork image reappears.

3. If you would like to save or print the drawing, you can do so by choosing Save or Print from the File menu.

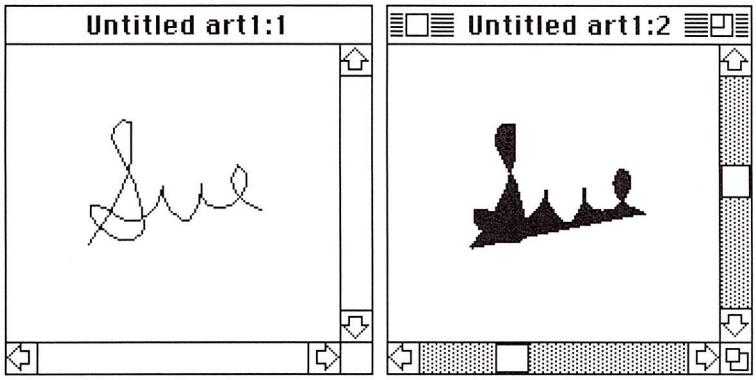
What's next?

If you would like to practice using the freehand tool, do the exercises in the "Try It Out" section.

The next lesson shows how to use the pen tool to create straight lines.

Try it out!

- Try changing the fill and stroke of your mushroom by using the Paint dialog box. Then preview your drawing to see the results. Be sure the mushroom is selected before you paint it.
- Now that you have a sense of how the freehand tool works, try drawing some sketches of your own. Add different attributes and preview the results.
- Write your name with the freehand tool, change the fill to None, and stroke the line with different percentages of black at various weights.
- If you fill an open path, the program will fill it based on an imaginary line between the two endpoints.



To clear your screen, choose Select All from the Edit menu, and then press the Backspace key. Remember that you cannot clear your screen when you are in preview mode.

Q&A

Q: How can I draw a perfectly straight line with the freehand tool?

A: You don't; you use the pen tool to draw straight lines.

Q: My drawings are not shaped exactly the way I want them to be. How can I fine-tune a drawing?

A: You will learn more about fine-tuning and editing in a later lesson.

Q: When I click on the screen, I get a little black square. Why?

A: The freehand tool is selected, and you are creating paths that consist of a single anchor point. When you hold down the mouse button and drag, you can create lines. If you don't want to create paths, click on the selection tool (the arrow) in the toolbox.

Q: When I draw, some of the dots in my lines are farther apart than others. Why?

A: When you draw with the freehand tool, the faster you move your hand, the fewer dots appear on the screen. The number of dots has no effect on the number of anchor points in the final paths.

Q: Do I need a scanned image to draw with the Adobe Illustrator 88 program?

A: You can draw with or without a scanned image. Working with scanned images is covered in a later lesson.

Q: I drew several paths overlapping one another. Why don't some of the paths I drew show up when I choose the Preview Illustration command?

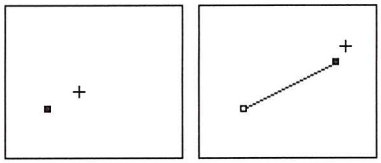
A: The Adobe Illustrator 88 program creates objects in preview mode according to the order in which you painted them. The objects that you cannot see may be layered behind other objects. To relayer, select the objects in question and choose Bring To Front from the Edit menu. Also check the paint attributes. An object with no fill and no stroke will be invisible.

Lesson 2: *Drawing Straight Lines*

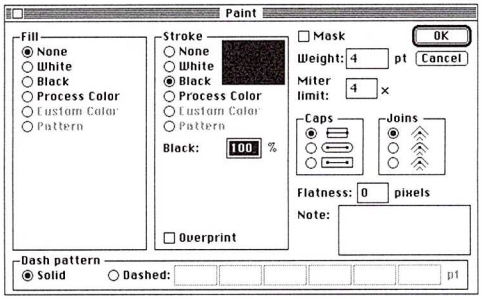
Overview

Drawing a Straight Line with the Pen Tool

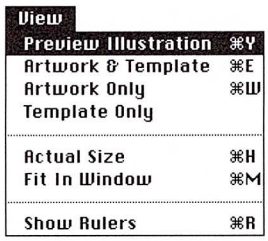
1. Select 

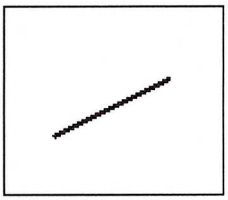
2. Click 

3. Choose



4. View





Also in this lesson:

- Stroking a line
- Opening two windows simultaneously
- Previewing
- Copying a line
- Adjusting a line

Drawing Straight Lines

In this lesson, you will learn how to create and manipulate straight lines.

Begin with a blank document. (If you have a window on your screen that you would like to clear, choose Select All from the Edit menu, and then press the Backspace key. If you are just starting the program, choose New from the File menu and click None in the dialog box.)

When you want to create straight lines, you use the pen tool.

IMPORTANT: If you have used other Macintosh graphics applications, you are probably accustomed to moving the mouse to create lines just as you would use a pen. As you saw in Lesson 1, this is how you use the freehand tool. However, in addition to drawing this way, the Adobe Illustrator 88 program provides powerful tools that help you draw straight lines and smooth curves. Working with the pen tool is equivalent to drawing with a pen and straightedge or a French curve.

When you create lines with the pen tool, you do not drag to draw the line. Instead, you use the mouse to indicate where you want the line drawn—that is, where to begin and where to end. Then you use a dialog box to indicate the width and the shading of the line. The Adobe Illustrator 88 program generates the line according to your specifications.

Create a path for a straight line

1. Click on the pen tool in the toolbox.

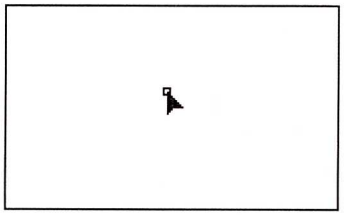
2. Move the pointer to the drawing area.

   When you move the pointer to the drawing area, it turns into an x. As you become familiar with the Adobe Illustrator 88 program, you will learn what the different pointer shapes mean. When the pen tool is selected, an x-shaped pointer means that you are about to create a new path.

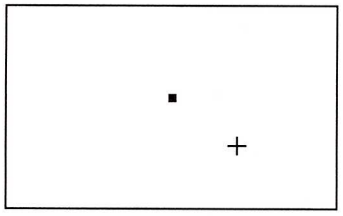
   Next, you indicate where you would like to begin drawing the line.

3. Click the mouse button once in the drawing area. *Do not drag*; just click.

When you pressed the mouse button, the pointer turned into an arrowhead. The point where you clicked is called an anchor point; it is where the line will begin. The anchor point is displayed as a square.

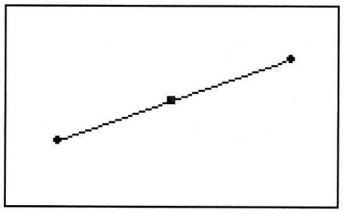


When you released the mouse button, the pointer changed to a cross, and the anchor point became a solid square. (When an anchor point is a solid square, it is selected.) When the pen tool is selected, and you see the cross pointer, you are adding to an established path.



Make a mistake?

If you dragged instead of clicking, your screen may look like this:

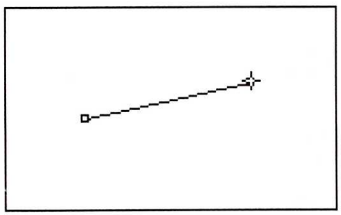


If it does, choose Undo from the Edit menu and start over. You can remove any selected anchor points (ones that are solid squares) by choosing Cut from the Edit menu or pressing the Backspace key. To select an unselected anchor point (a hollow square or sometimes an x), click on the selection tool, and then click on the anchor point.

Next, you indicate where you want the line to stop.

4. With the pen tool selected, move the pointer about an inch to the right and click again.

   A line appears between the two points.



   If lines on the screen appear jagged, it is due to the low resolution of the screen. The lines will be straight when they are printed.

   Finally, you indicate that you are finished with this particular line.

5. Click on the pen tool in the toolbox. The pointer becomes an x when you move it to the drawing area.

NOTE: When the pen tool is selected and the pointer is a cross, each time you click the mouse button, the Adobe Illustrator 88 program creates an anchor point and draws a line from the previous anchor point. Clicking on the pen tool in the toolbox indicates that you do not want to create any more lines connected to the current anchor point.

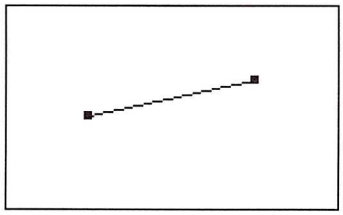
Paint a path

Once you have created a path, you can add various paint attributes to it, just as you did earlier with the mushroom. In this lesson, you will stroke the path; that is, you will have the Adobe Illustrator 88 program draw a line of a specified weight, or width, on the path you have created. You will then use the Preview Illustration command to see the result—a wide, straight line.

1. Click on the selection tool in the toolbox.

2. Move the pointer to anywhere on the line.

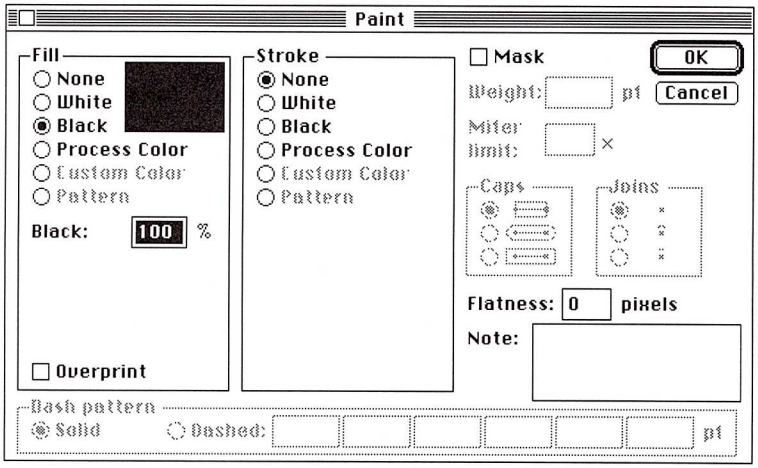
3. Hold down the Option key and click the mouse button.



Both anchor points become solid which indicates that they are selected.

NOTE: Holding down the Option key while you click on a path selects all the anchor points on that path. You get the same result as if you had used the selection marquee to drag. You will find that the Option-click selection action is useful when you have overlapping paths, and you do not want to select all of them.

4. Choose Paint from the Style menu. The Paint dialog box appears.



Next, you will use the dialog box to change a single attribute of the line; you will make the line appear wider. You do this by stroking the line and giving it a specified weight, or thickness. Line weights are expressed in points. There are 72 points to an inch.

5. In the Fill options, click None.

6. In the Stroke options, click Black. The preset value of 100 percent appears.

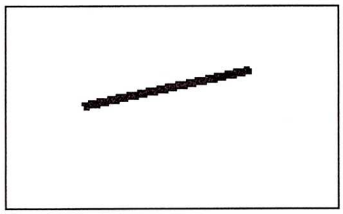
When you clicked Black in the Stroke options, the Weight field became active. It shows the current line weight.

7. Click on the word "Weight" to highlight the field, and type 4.
8. Click OK.

   To see a preview of the stroked line:

9. Choose Preview Illustration from the View menu.

   You have created a line that is stroked with a 4-point line weight. Your line should look something like this:



10. Choose Artwork Only from the View menu.

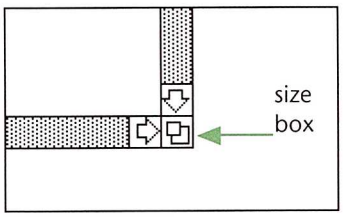
    The artwork image reappears.

Open two windows simultaneously

Sometimes when you are working, you will want to see both the artwork and the preview image at the same time. Watching a preview of your drawing as you are creating it will help you when you are learning to use the Adobe Illustrator 88 program. Follow these steps to display both an artwork window and a preview window on your screen.

You begin by resizing your artwork window to fill half the screen.

1. Move the pointer to the size box in the lower right corner of the window. Hold down the mouse button, and drag the pointer to the left until the window fills about half your screen. Release the mouse button.



You may need to reposition the line so that you can see it.

2. Click on the hand tool in the toolbox.

3. Move the pointer to the drawing area, hold down the mouse button, and drag until the line is near the top center of the window.

4. Choose New Window from the Window menu.

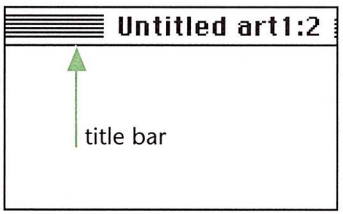
   The program creates a second window with the same contents as the original window. This window is entitled *Untitled art1:2*.

   Next, you resize the second window and move it to the right.

5. Move the pointer to the size box in the lower right corner.

6. Drag to the left until the window is the same size as the original.

7. Move the pointer to the window's title bar. Be careful not to click the close box or the zoom box.

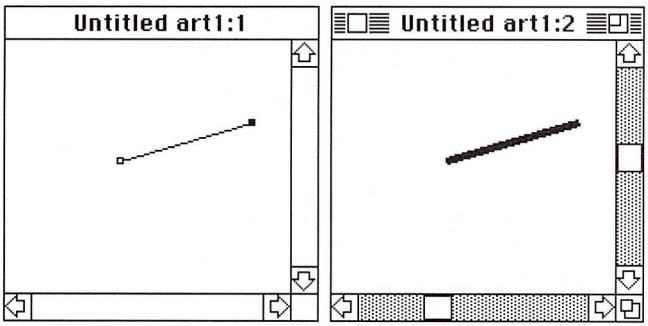


8. Hold down the mouse button and drag the window to the right so that you can see both windows on your screen.

9. Choose Preview Illustration from the View menu.

   Window 2, on the right, displays the line in preview mode.

   When you are finished, your screen should look like this:

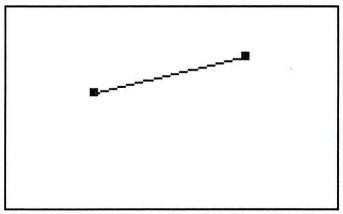


10. Click in window 1 to make it active.

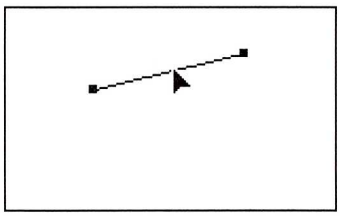
The scroll bars become shaded in window 1, which indicates that it is the active window. When you have two windows on the screen, only one can be the active window. You can make an inactive window active by clicking in it.

Copy a line

To make a copy of the line, use the selection tool to select the line in window 1 if it is not already selected. Be sure that both anchor points are solid squares, which indicates that they are selected.

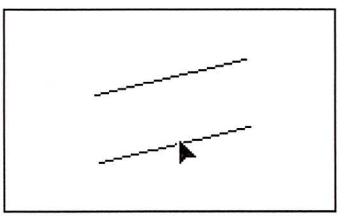


1. Move the pointer to any place on the line, and hold down the mouse button.



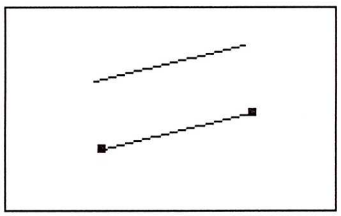
Option

2. Hold down the Option key.
3. Drag down about half an inch from the line.



A copy of the line will follow along with the pointer.

4. When the new line is positioned below the first, release the mouse button, and then release the Option key.



After you release the mouse button, a copy appears in the preview window.

Make a mistake?

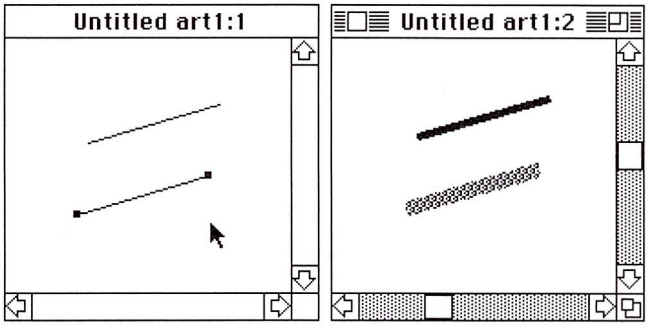
If you released the Option key before you released the mouse button, you have moved the line instead of duplicating it. Repeat the procedure above to duplicate the line.

Paint a line

Next, you will change the attributes of the second line by painting it. Both anchor points on the second line should be solid black squares, which indicates that it is selected. If it is not, use the selection tool to select it.

1. Choose Paint from the Style menu. The Paint dialog box appears.
2. In the Fill options, click None.
3. In the Stroke options, click Black.
4. In the Black field under Stroke, type 50.
5. In the Weight field, type 8.
6. Click OK.

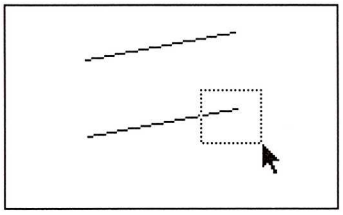
You can see the results in the preview window. You have created a line that is 50 percent black and 8 points wide, which is twice as wide as the original line. When printed, the line will appear as a smooth 50 percent gray shade.



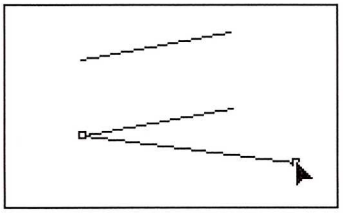
Adjust a line

You can adjust a line by selecting one of the anchor points and dragging. If both anchor points on the line are selected, click somewhere away from the line to deselect them. Otherwise, you will move the line instead of extending it. Remember that you can make changes only in the artwork window and only if the artwork window is the active window.

1. Using the selection pointer, drag the marquee across the area at the end of the line where a single anchor point is to select it.



2. Move the pointer to the selected anchor point, hold down the mouse button, and drag the anchor point away from its original position. You can see the results in your preview window when you release the mouse button.



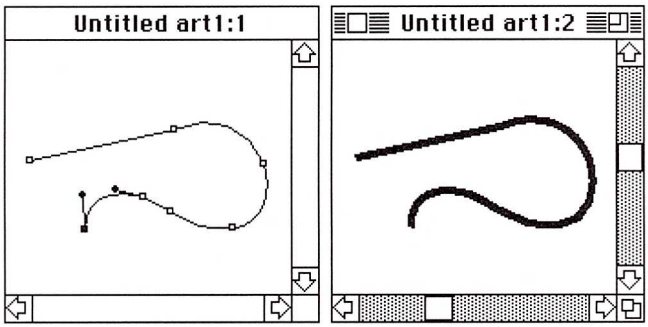
Extend a path with the freehand tool

You can use the freehand tool to add to a straight line path created with the pen tool.

1. Click on the freehand tool in the toolbox.

2. Position the pointer on the end of a line.

   Hold down the mouse button and drag to extend the path. Release the mouse button.



The anchor point where you began drawing with the freehand tool automatically becomes part of the original path with the line. You can use the freehand tool to append to the endpoint of any *open* path. You will learn about using the pen and freehand tools to create closed paths in a later lesson.

What's next?

If you want more practice and hints for creating straight line paths, do the exercises in the "Try It Out" section that follows. In the next lesson, you will learn to create simple curves using the pen tool. The lesson also explains how to work with the anchor points and the direction lines that the program creates when you draw with the freehand tool.

Try it out!

- Try drawing lines while watching the results in the preview window. The following are some tips and things to try.
- You can delete anything you draw by first using the selection pointer to select it and then choosing Cut from the Edit menu or pressing the Backspace key.
- If the preview window does not display what you have drawn in the artwork window, use the scroll bars to locate what you have drawn.
- Try drawing lines that have more than two anchor points. Remember to begin and end each path by clicking the pen tool.
- Draw a short line and duplicate it several times by selecting it, dragging the mouse, and holding down the Option key before you release the mouse button.
- Select different lines, choose Paint from the Style menu, and give the lines different attributes.

View		Paint	
Artwork	Preview	Stroke	Weight
		100	1
		100	4
		50	8
		75	10

- Draw a path for a line, and then in the Paint dialog box, click None in the Fill options and None in the Stroke options. Check the results in the preview window. The line will be invisible.
- Try drawing a dashed line. In the Paint dialog box, click None in the Fill options. Stroke the line with the weight of your choice. Then click Dashed in the Dash Pattern field. Type 3 in the first field and 3 in the second field.

Q&A

Q: I don't want any more lines, but everywhere I click I get another anchor point. What do I do?

A: Click on the pen tool to let the program know you are finished with this path.

Q: How can I draw a line that is perfectly vertical or horizontal?

A: Click on the pen tool, and click to set the first anchor point. Then, hold down the Shift key and click to set the second anchor point. The Shift key constrains the line to either horizontal, vertical, or a 45-degree angle, depending on where you click.

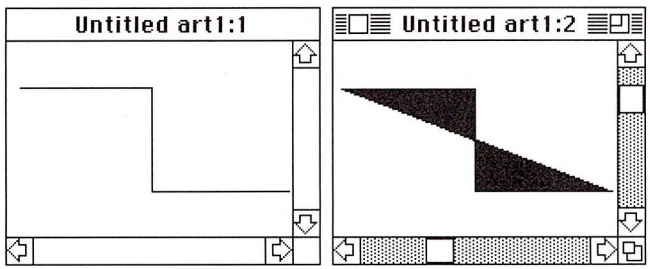
Q: How do I delete something I don't want on the screen?

A: First, select it by clicking on it or dragging over it with the selection pointer. Then, press the Backspace key or choose Cut from the Edit menu.

Q: I want to make a line longer, but when I place the selection pointer on the anchor point and drag, the entire line moves. How can I move only one anchor point?

A: The entire path for the line has been selected; that is, all the anchor points have been selected. To extend the line, you must select only the anchor point you want to move. First, deselect the line by clicking in the window away from the line. Next, click on the anchor point you want to drag. When it is selected (solid), you can drag it and the rest of the path will remain in place.

Q: I have drawn several connected lines in my artwork window, and the preview window has strange shapes in it. What happened?



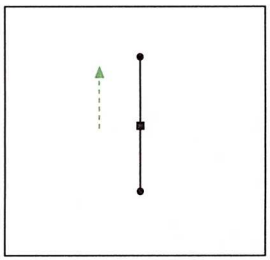
A: When you used the Paint dialog box, you clicked one of the Fill options. The line shown above is filled with 100 percent black. You will learn more about filling in a later lesson. To see the lines without the fill, use the Paint dialog box to set the Fill options to None.

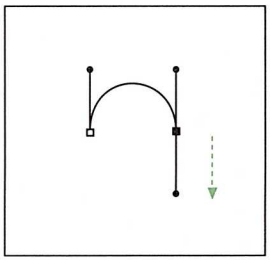
Lesson 3: *Drawing Simple Curves with the Pen Tool*

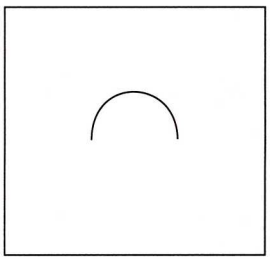
Overview

Drawing Simple Curves with the Pen Tool

1. Select 

2. Drag 

3. Drag 

4. Result 

Also in this lesson:

- Making copies of a curve
- Moving anchor points
- Moving segments
- Moving direction points

Drawing Simple Curves with the Pen Tool

In this lesson, you will learn how to create and edit a single curved line. When you draw curves with the pen tool, you determine where to put the anchor points; when you use the freehand tool, the program places the anchor points and the direction lines. This lesson describes how to create curves with the pen tool and how to edit curves created with the pen and freehand tools. Later lessons will show you how to use the pen tool to draw curves adjacent to other curves and straight lines.

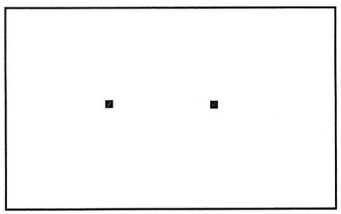
Read about curves before you draw

If you would like to understand how the Adobe Illustrator 88 program creates curved lines with the pen tool, read the following background section. If you would rather begin drawing curves right away, skip ahead to "Create a Curved Path."

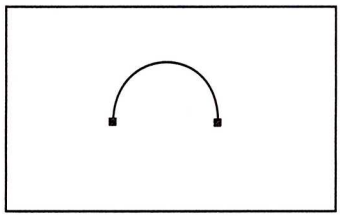
Understanding how to draw curves

As you learned in the last lesson, drawing a straight line involves telling the Adobe Illustrator 88 program where to begin and end the path that will be the line and then stroking the line. Creating a path for a curved line is a similar process. To generate a curved line, however, the program requires more information than just where to begin and end. Understanding how the program creates curves from the information you give it will make it easier for you to draw the kinds of curves you want. This section presents a brief overview of how curves are created with the pen tool. After you read this section, you will practice drawing curves.

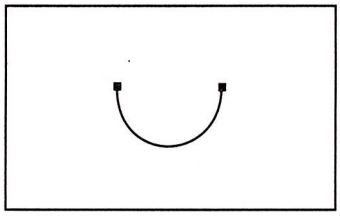
Just as you did with straight lines, you indicate where to start and stop the curve by creating anchor points. Imagine that you want to draw a curve between these two anchor points:



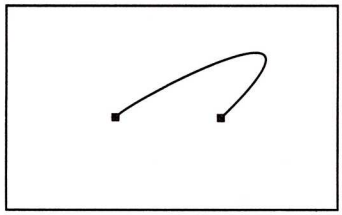
You might want to draw this curve,



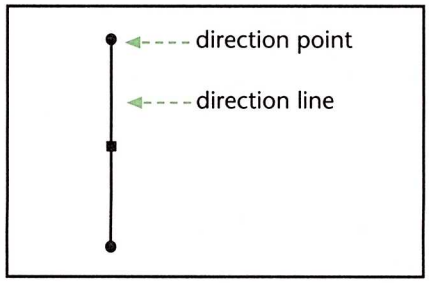
or this curve,



or this curve:



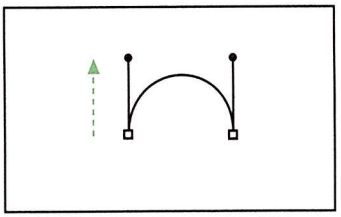
To help you tell the program just what kind of curve you would like to draw, the Adobe Illustrator 88 program adds direction lines and points on your screen when you draw curves. These direction lines and points are simply aids that help you create curves; they are not printed on your final drawing.



You use these direction points like "handles" to communicate information about the kind of curve you want.

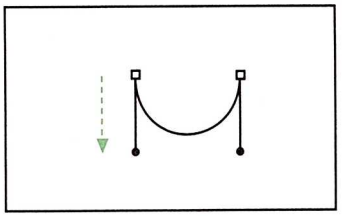
For example,

if you want this curve,



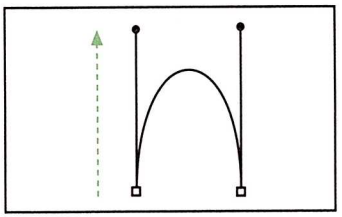
you drag the direction point *up*.

If you want this curve,

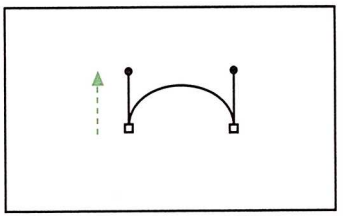


you drag the direction point *down*.

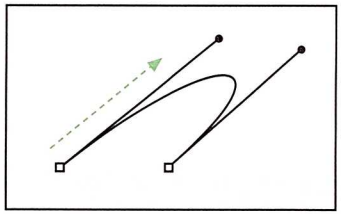
If you want this curve,



you drag the direction point a lot farther than you would if you wanted this curve.



If you want a different slope to your curve, you drag the direction point accordingly.



As you can see, the way you move the direction point delineates exactly how you want your curve to look—and that's a lot of information (the size, the slope, and the direction). When you draw a curve with a pen and paper, you take all these aspects into consideration, but you may not consciously think about them; you visualize the curve and draw it.

Working with direction points takes practice. First attempts may not produce the desired results because you are entering a lot of information in a way you have not done before. But it's a lot like driving a car; pretty soon you will be doing it without thinking about the process. Keep in mind that the Adobe Illustrator 88 program is very forgiving. It's easy to edit the lines and curves you create.

Create a curved path

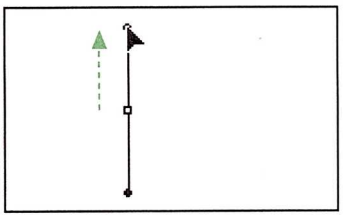
If you have just completed the last lesson, click in window 2 to make it active, and then choose Close from the File menu. Drag the size box to the right to resize window 1 to a full screen (or click the zoom box in the upper right corner of the window). Clear the screen by holding down the ⌘ key and typing A to select everything, and then pressing the Backspace key.

NOTE: Holding down the ⌘ key and typing A is the equivalent of choosing Select All from the Edit menu. You must release the ⌘ key and the A before you press the Backspace key to clear all the objects on the screen.

If you are just starting the program, choose New from the File menu, and then click None.

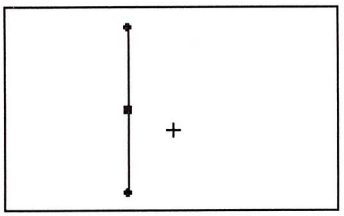
You draw curved paths with the pen tool by dragging as you set down anchor points.

1. Click on the pen tool and move the pointer to the top half of the drawing window. The pointer will be an x.
2. Hold down the mouse button, and drag the pointer straight up about an inch.



The first anchor point is established as soon as you press the mouse button. Pressing the mouse button also causes the pointer to turn into an arrowhead. When you drag, you see the direction lines and points (solid circles). Dragging upward moves the top direction point along with the pointer.

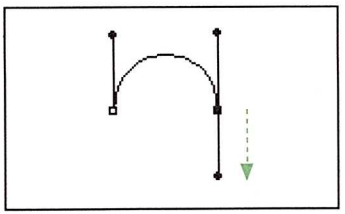
3. Release the mouse button.



Although you have set only the first anchor point, you have already communicated information about the direction, size, and shape of the curve.

Next, you indicate where you want the curve to end.

4. Move the cross pointer about an inch to the right of the first anchor point. Remember that the solid square represents the anchor point.
5. Hold down the mouse button, and drag the direction point down about an inch.
6. Release the mouse button.



As soon as you started dragging, a second anchor point appeared, as did a curved segment between the two points.

Make a mistake?

If you make a mistake, choose Undo from the Edit menu and try again.

7. Click on the pen tool to indicate that you are completing the current path.

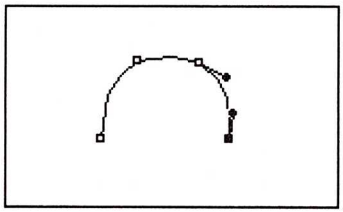
NOTE: The Adobe Illustrator 88 program will continue creating curved lines between the points you set until you click on the pen tool or the selection arrow.

You have now created a path consisting of a single curve. The path begins and ends with anchor points. The line between the two anchor points is called a *segment*. Before drawing more complicated curved lines, you will draw a curve with the freehand tool. Next, you will practice making changes to curves.

You can also create simple curves with the freehand tool.

1. Click on freehand tool in the toolbox.

2. Hold down the mouse button and drag to create a simple curve like the one you drew with the pen tool. Release the mouse button.



Depending on the steadiness of your hand and the size of the curve, you may have more or fewer anchor points than are shown in the example. Although you can draw the same curve with either tool, you will find that curves generated with the pen tool are perfectly smooth, and simple curves drawn with the pen tool require only two anchor points. Once you have practiced with both tools, you will have a sense of when it is best to use either tool.

About selecting

To edit a curved segment, you first have to *select* the area you want to change. Even with a single curve, you have a variety of selection options. You can move the anchor points, the direction points, or the segment itself while leaving the anchor points fixed. You can even move the entire path. Knowing how to select what you want to edit is a crucial part of learning the Adobe Illustrator 88 program.

Objects are selected with the selection tool, which you get by clicking on it in the toolbox. You select an anchor point by clicking on it. The pointer must be within 2 pixels of the object you want to select. You can also use the selection tool to drag the marquee (dotted rectangle) across an area. All anchor points and segments inside the rectangle will be selected. Finally, you can select all the anchor points in a path by holding down the Option key and clicking on the path with the selection pointer. To deselect, click in the white space away from your drawing.

First, you will delete the curve you just drew with the freehand tool.

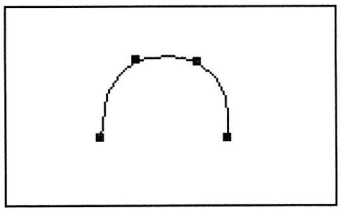
⌘

1. Hold down the ⌘ key to access the selection pointer. The pointer turns into an arrow.

   You can temporarily use the selection pointer by holding down the ⌘ key. The pointer will turn into an arrow and remain so for as long as you hold down the ⌘ key. You will find this useful when you are drawing objects and want to switch to the selection pointer momentarily.

2. Drag the marquee around the freehand curve.
3. Release the mouse button, and then release the ⌘ key.

   All anchor points are selected, and the direction points and lines do not show.



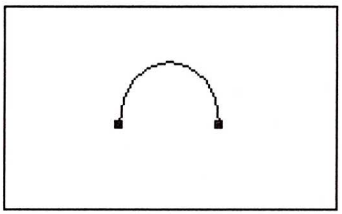
4. Press the Backspace key to delete the path.

Make copies of the curve

Next, you will make several copies of the original curve, so that you will have them to practice with.

1. Click on the selection tool.

2. Drag the marquee around the entire curved path that you created earlier with the pen tool.



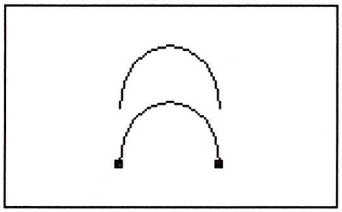
Note that the two anchor points are selected and that the direction points do not show.

3. Position the pointer anywhere on the curve, and drag the curve downward until it is just below the original curve. *Do not* release the mouse button.

4. Hold down the Option key.

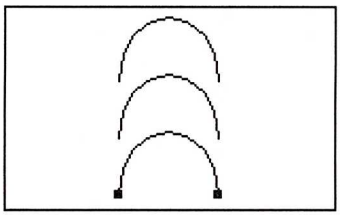
5. Release the mouse button, and then release the Option key.

   A copy of the curve appears.



6. Choose Transform Again from the Arrange menu.

   Your screen should look something like this:

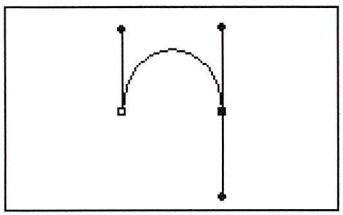


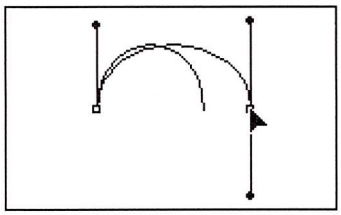
The Transform Again command lets you repeat many operations. In this case, you repeated the "move and copy" operations that you just performed. You can also use Transform Again with scaling, rotating, and reflecting operations.

Change the shape of a curve by moving an anchor point

You can change the shape of a curve by moving the anchor points of the curve. It does not matter whether the anchor point has been created with the freehand tool or the pen tool.

1. Click in the white space of the window to deselect everything.
2. Select an anchor point on one of the curves by clicking on the end of the path with the selection pointer. Selected anchor points are solid black squares. When an anchor point of a curve is selected, the direction lines and direction points (solid circles) of the curve appear.
3. Hold down the mouse button and drag to move the selected anchor point up and down, and back and forth, to see the changes made to the curve.

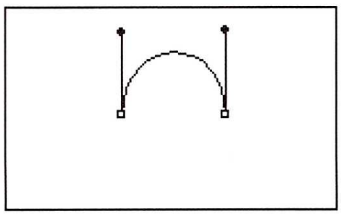




4. Release the mouse button.

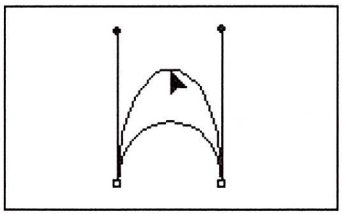
Change the shape of a curve by moving the segment itself

1. Click in the white space of the window to deselect everything.
2. Choose a curve you have not edited, and click on the curved line.



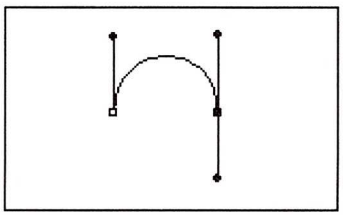
Notice how the screen changes to show you what is selected. The anchor points are hollow (deselected), and the upper direction points appear. You have selected only the segment, not the anchor points.

3. Move the pointer to the curved line, and hold down the mouse button.
4. Drag the segment up and down to see the effects. The anchor points remain stationary and the segment changes shape.



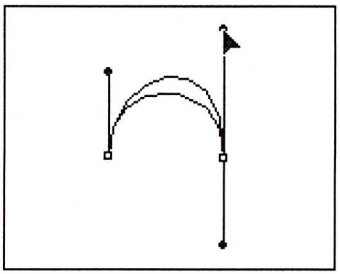
Change the shape of a curve by moving the direction points

1. Click in the white space of the window to deselect everything.
2. Choose a curve you have not edited, and click on an anchor point.



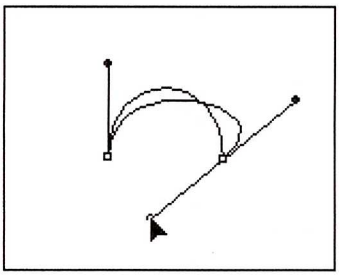
Note how the screen changes to show you what is selected. The selected anchor point is solid, and the direction points and lines appear.

3. Drag one of the direction points up.



Notice how the curve changes.

4. Drag to the right and left to see the slope of the curve change.



As you have seen, creating a curve involves giving the program a lot of information about that curve. But the Adobe Illustrator 88 program also lets you change your mind and move curves until you get them right. By moving anchor points, direction points, and segments, you can create any kind of curve you want.

What's next?

If you want more practice adjusting single curves, use the pen tool to draw them, and then experiment by moving segments, anchor points, and direction lines to change the curve.

Once you have a sense of how direction points and anchor points work, you are ready to learn how to draw several connected curved lines with the pen tool. The next lesson shows you how to put curves together with other curves and how to draw paths that contain both curves and lines.

Q&A

Q: I was trying to begin a curve, and all I got was a single anchor point.

A: You clicked the mouse instead of dragging.

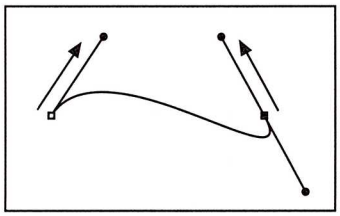
Q: Are anchor points and direction lines created with the freehand tool different from those created with the pen tool?

A: No, they work exactly the same way.

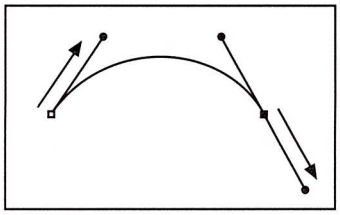
Q: Can I stroke a curved path?

A: Yes, just as you do a straight line path.

Q: Why does my curve look like this?



A: You dragged in the same direction for both anchor points. To create a smooth curve between the two points, you begin by dragging in the direction of the bump. Then you drag in the opposite direction.

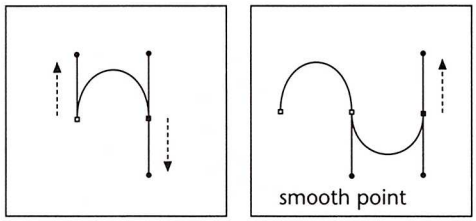


Lesson 4: *Drawing Curves with Other Curves and Lines*

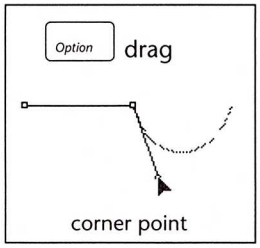
Overview

Drawing Curves with Other Curves and Lines

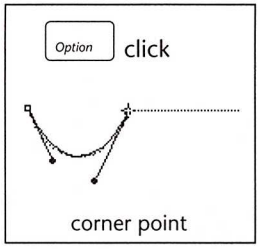
Add a curve



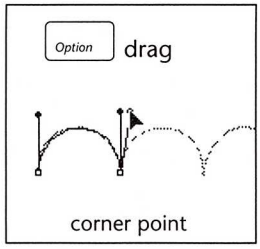
Create a corner



line to curve



curve to line



curve to curve

Also in this lesson:

- About templates

Drawing Curves with Other Curves and Lines

Now that you have a feel for drawing a single curve, you are ready to learn how to use the pen tool to draw several connected curves and to create lines and curves in a single path. Although you can use the freehand tool to draw curves that connect with other curves and lines, in some situations you will prefer the smoother curves created with the pen tool.

This lesson also shows you how to use a template for tracing.

About templates

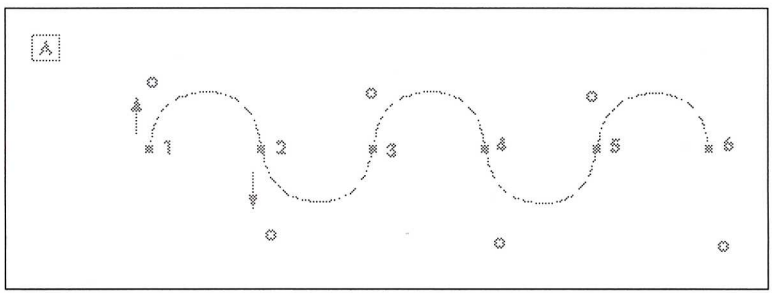
Until now, you have been drawing without a template. You can also create artwork by tracing over an image from a template that you have created with a scanner or another program. When you open a template, the image appears on your screen as a collection of light gray dots, or pixels. You don't manipulate the contents of the template; you use the template as a guide in creating your artwork.

Templates designed to help you learn the Adobe Illustrator 88 program are included with the program.

1. If you have already started the program, close any open windows by clicking the close box.
2. Choose New from the File menu.
3. When the dialog box appears, you will see a list of folders and files on the disk. Practice templates are included with the Adobe Illustrator 88 software in the Tutorial Folder. Click Drive, if you need to, to find the folder. Then open the file named *Curve Template* by double-clicking on its title.

   When you open a template, the middle of the document is displayed on your screen. You can use the scroll bar or the hand tool (accessed by holding down the Space bar) to scroll the document to see curve A.
4. Scroll to see curve A.

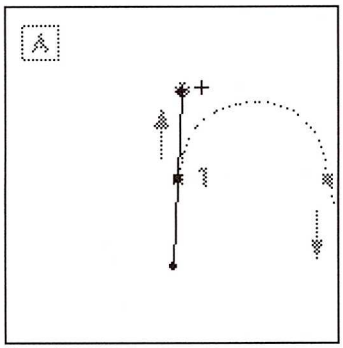
   Your screen should look like this:



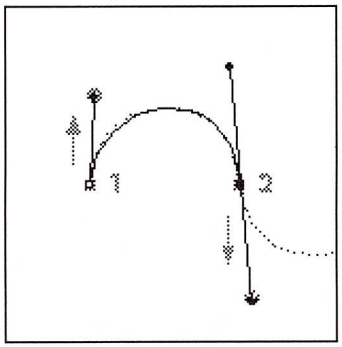
Draw simple connected curves on a path

First, you will trace several connected curved segments. The template will show you where to set your anchor points, which way to drag direction points, and where to place them. Don't worry about matching the curves exactly.

1. Click on the pen tool.
2. Position the x pointer at point 1 on the template.
3. Hold down the mouse button, and drag *upward* until the direction point is over the hollow circle on the template. Remember that dragging a direction line indicates the direction of the next curve. Do not confuse the direction line with a path that creates a line in the drawing.
4. Release the mouse button.



5. Position the cross pointer at point 2 on the template.
6. Hold down the mouse button, and drag *down* until the direction point is over the hollow circle on the template, just below the second anchor point.
7. Release the mouse button.

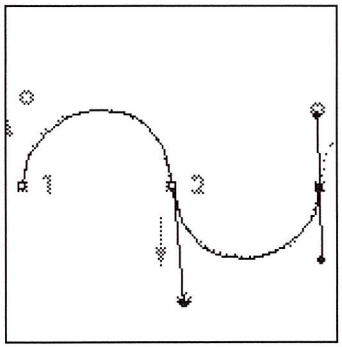


As you can see, you have created the first segment of the path.

Make a mistake?

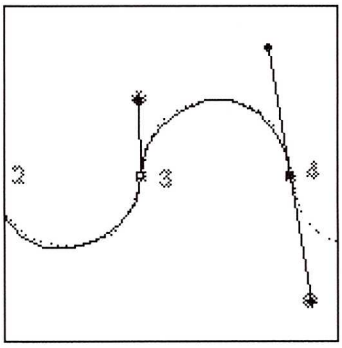
Remember that you can always choose Undo from the Edit menu to undo your last action. You can also choose Select All and then press the Backspace key to delete everything and start over.

8. Position the pointer at point 3 on the template.
9. Hold down the mouse button, and drag up to the hollow circle.
10. Release the mouse button.



You have just created two curved segments in the same path.

11. Position the pointer at point 4 on the template.
12. Hold down the mouse button, and drag down to the hollow circle.
13. Release the mouse button.

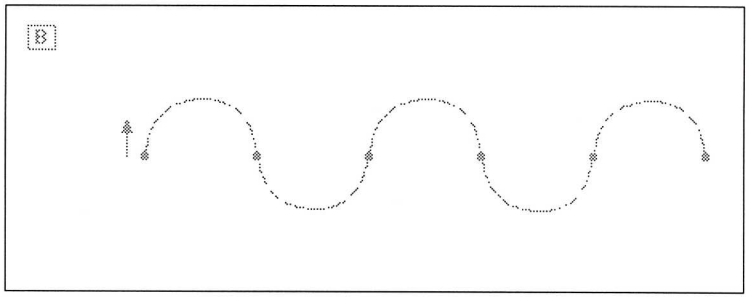


14. Finish tracing the outline by positioning the pointer on each numbered point and dragging to the appropriate hollow circle above or below it.
15. Click on the pen tool to indicate that you have completed the path. The pointer will change to an x to indicate that you are ready to start a new path.

Practice dragging direction points

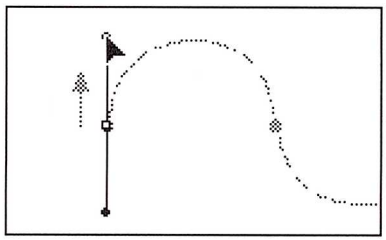
1. Hold down the Space bar and use the hand tool to scroll to curve B on the template.

   As you already know, the position of your direction points conveys a lot of information about the curves you draw. Curve B is similar to curve A, except that there are no circles to tell you where to drag the direction points. Anchor points and an arrow showing which way to drag are provided to help you get started.



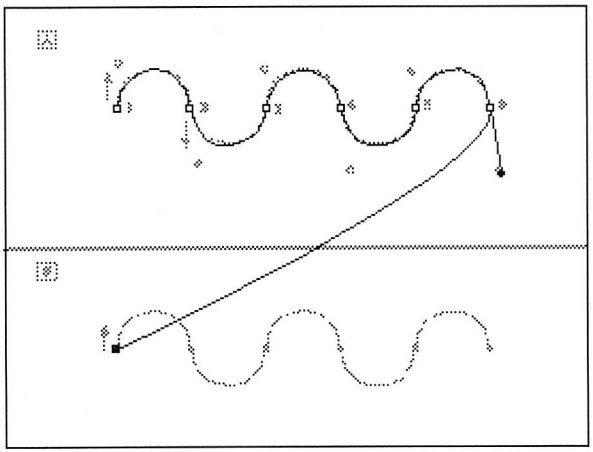
2. Click on the pen tool.

3. Position the pointer over the first anchor point, and drag upward.

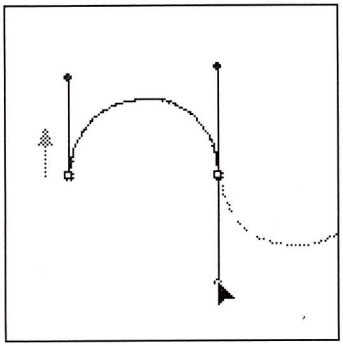


4. Release the mouse button.

IMPORTANT: If you forgot to click on the pen tool at the end of the last path, the program will connect the last two anchor points you set. If this happens, choose Undo from the Edit menu to delete the path, and then click on the pen tool and start again.



5. Position the pointer over the second point, and drag down to make the curve segment appear. Move the direction point to get a good approximation of the template.



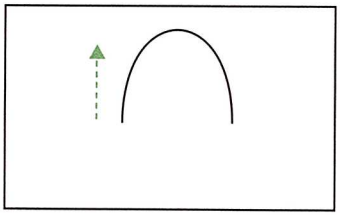
6. Release the mouse button.

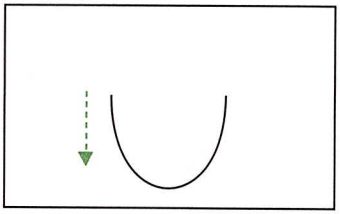
About direction points

When you are just beginning to draw curves, you probably won't have a sense of how far or where to drag the direction points. You can usually watch the screen to see the effect you are getting. The following rules should help.

In which direction do I drag?

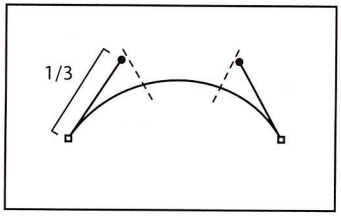
Follow the *Bump* rule. Drag in the direction of the bump on the curve you are about to create. For an upward curve, drag up; for a downward curve, drag down.





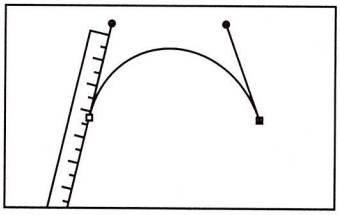
How far should I drag?

Use the *One-Third* rule. Imagine that the line forming a final curve is stretched out flat in a straight line. Drag your direction point about one-third of the straight-line length of the curve.



At what angle should I drag?

Employ the *Tangent* rule. Imagine that you are butting a ruler up against the curve and that the ruler is touching the curve at its anchor point. The ruler is *tangent* to the curve because it only touches it at one point. Drag your direction point along the angle of the ruler.



7. Continue creating the curves until you have completed the entire path.
8. Click on the pen tool.

Practice setting anchor points

Next, you will draw a curved path to match a template with no anchor points or direction hints. This is, of course, similar to what you will be doing when you trace templates of your own.

1. Hold down the Space bar and use the hand tool to scroll down to curve C.

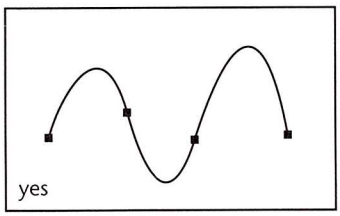
2. Click on the pen tool.

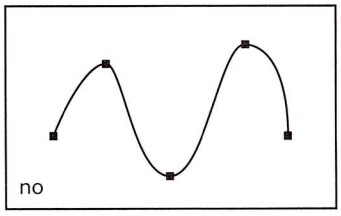
3. Position the x pointer on the beginning of the line, hold down the mouse button, and drag upward. Release the mouse button.

4. Decide where to place the second anchor point.

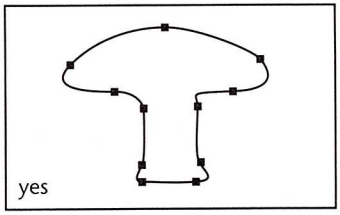
About setting anchor points

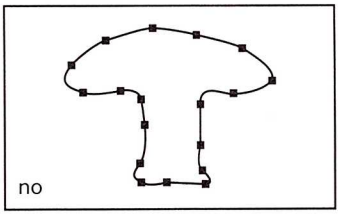
Learning where to place anchor points is an important part of learning the Adobe Illustrator 88 program. In general, when you create anchor points, you want them to be at the beginning and the end of each bump or curve, rather than at the top or the bottom of a curve.





The program lets you place as many anchor points as you want, at whatever points you choose on a path. Using fewer anchor points makes smoother curves, and takes less time and computer memory. Curves with fewer anchor points are easier to edit.





5. Continue setting anchor points and dragging direction points until you complete the path.

6. Click on the pen tool to end the path.

Changing direction and creating corners

Sometimes you will want to use the pen tool to create a path that consists of curved segments and straight lines. Although lines and curves both have anchor points, you need to let the Adobe Illustrator 88 program know that you are making a change from one to the other. You do this by establishing what is called a *corner point*.

NOTE: When you change from lines to curves with the freehand tool, the program generates the corner points for you; you do not need to do anything special.

Change from lines to curves with the pen tool

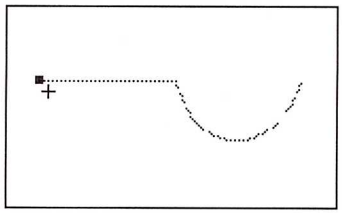
Suppose that you have created a straight line and want to add a smooth curved segment to the path using the pen tool.

1. Close any open windows.
2. Choose New from the File menu.
3. Locate the file named *Corner Template* and open it.

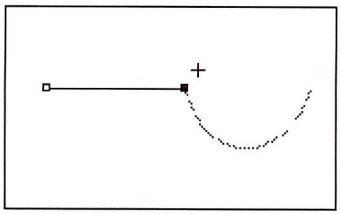
   First, create the line segment with two anchor points.

4. Use the hand tool to scroll until line A is on your screen.

5. Click on the pen tool.
6. Click to set the first anchor point on the left side of the line. *Do not drag.*



7. Move the pointer and click to set the second anchor point of the line.

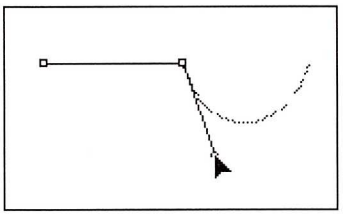


Next, make the second point a corner.

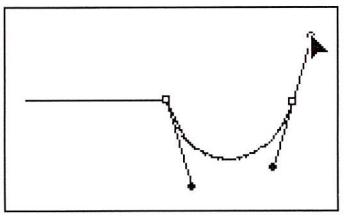
8. Position the cross pointer on the second anchor point.
9. Hold down the Option key.

Option

10. Hold down the mouse button and drag to establish the direction of the outgoing curve. Notice that you have dragged a direction point.



11. Release the Option key, and then release the mouse button.
12. Move the cross pointer to where you want the second anchor point for the curve, and drag to create the segment.



Remember to drag, not click.

If you try to drag beyond the edge of the window, the window will automatically scroll. Use the hand tool to reposition the drawing area if you need to.

13. Click on the pen tool to end the path.

Remember that you create straight lines simply by clicking anchor points. When you want to drag a direction point for a curve, you must first indicate that you're changing to something different. You do this by using the Option key to create a corner.

Change from curves to lines with the pen tool

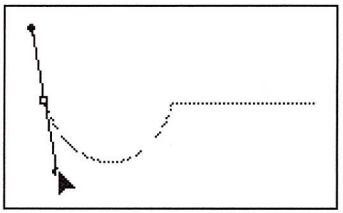
Next, you will practice creating a corner point where a path changes from a curve to a line.

First, create a curved segment with two anchor points.

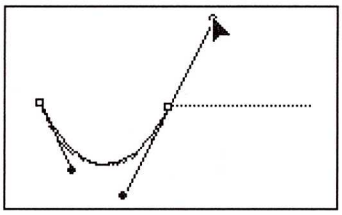
1. Use the hand tool to scroll until line B is on your screen.

2. Click on the pen tool.

3. Drag to set the first anchor point of the curve.



4. Move the cross pointer, and drag to set the second anchor point of the curve.



Next, make the second anchor point a corner point.

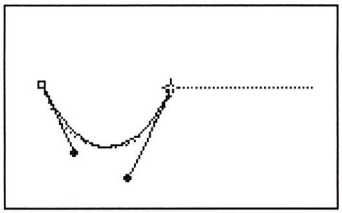
5. Position the cross pointer on the second anchor point.

6. Hold down the Option key.

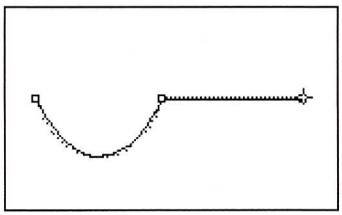
7. Click the mouse button. *Do not drag.*

8. Release the Option key.

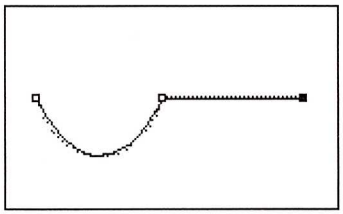
   Notice that the upper direction point and line disappeared when you established the corner point.



9. Move the pointer to the right, and click to add the line.



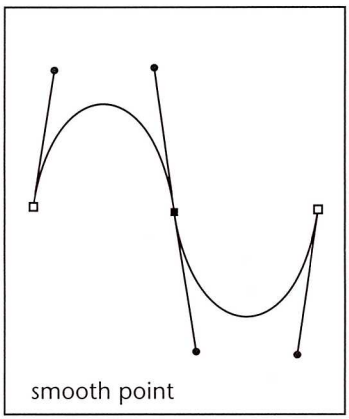
10. Click on the pen tool to end the path.



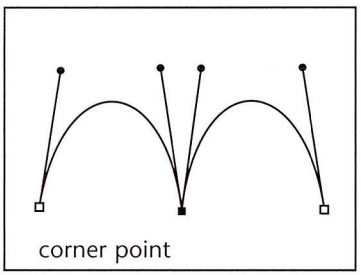
Change from one kind of curve to another with the pen tool

In some cases, you must create a corner point to change from one kind of curve to another.

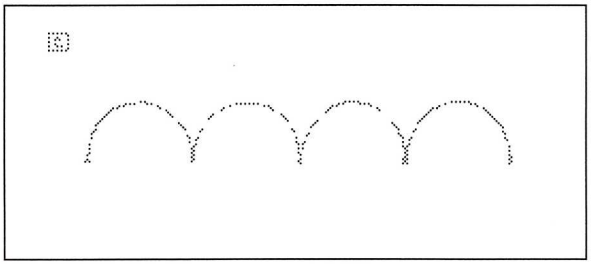
Not all curves are alike to the Adobe Illustrator 88 program. For the practice curves you have drawn so far, the segments that approach an anchor point have been similar to the ones that leave the anchor point. These curves are similar to a sine wave—they curve up and down. The point where they join is called a *smooth point*; the end of one curve flows smoothly into the beginning of the next, and the anchor point and both direction points lie on a straight line.



When you are drawing, however, you may want the curves to extend in a different direction or be a different size or shape. To do this, you create a corner point. (When you use the freehand tool, the program automatically generates corner points for you.)



1. Use the hand tool to scroll until line C is on the screen.

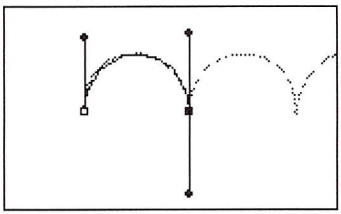


First, create the initial curved segment.

2. Click on the pen tool.

3. Drag upward to set the first anchor point.

4. Move the pointer and drag downward to set the second anchor point.



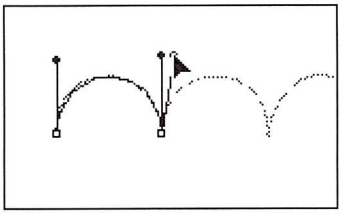
Next, make the second anchor point a corner point.

5. Position the cross pointer on the second anchor point.

Option

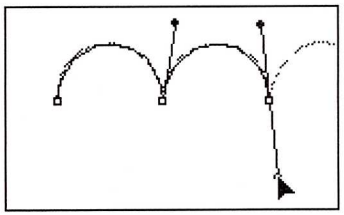
6. Hold down the Option key.

7. Hold down the mouse button, and drag to establish the direction of the outgoing curve. Be sure that you are holding down the Option key before you start to drag.



8. Release the Option key, and then release the mouse button.

9. Move to the third anchor point, and drag downward to establish the second curve.



10. Reposition the pointer over the third anchor point, hold down the Option key, and drag upward to establish a corner point.
11. Continue until you have drawn the entire path.
12. Click on the pen tool to end the path.

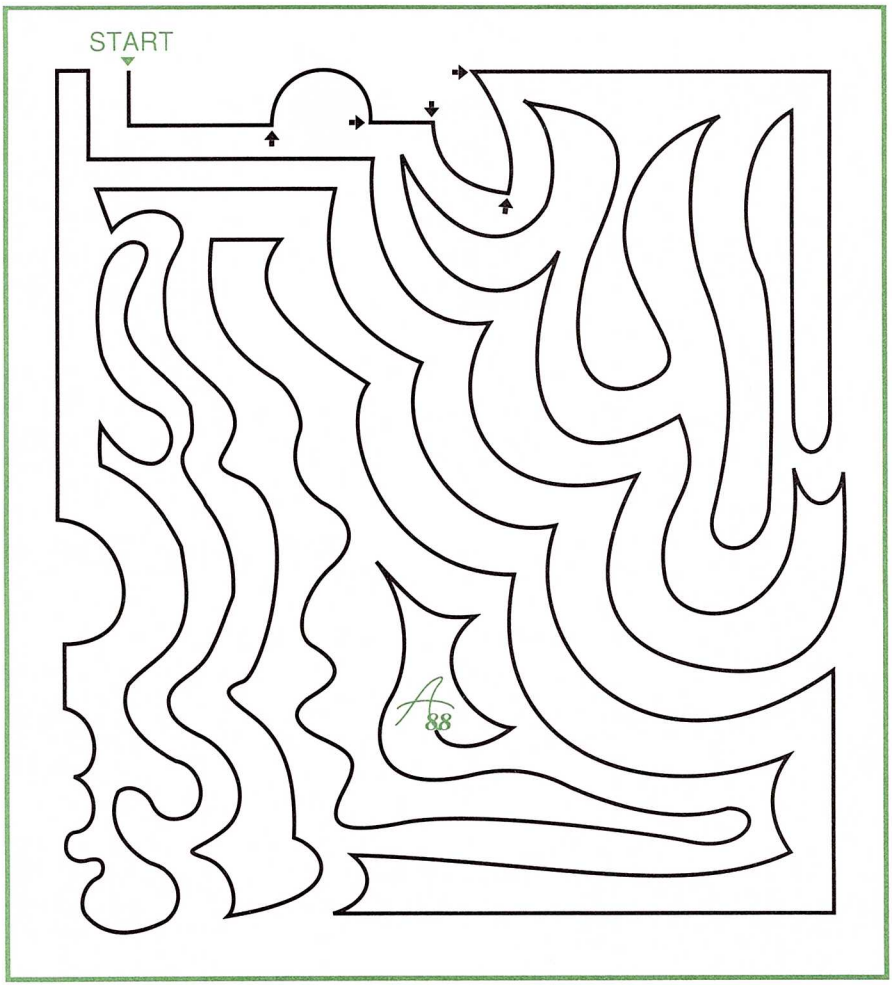
What's next?

Once you can create complex paths with the pen tool, you have mastered the most difficult part of learning the Adobe Illustrator 88 program. The next lesson, the final one for drawing paths, teaches you how to create closed paths and filled shapes using both the pen and freehand tools.

Try it out!

- Open the template named *Maze Template*.

  Practice drawing the maze. Begin by clicking on the pen tool. Remember to hold down the Option key when you want to create a corner point. The arrows show where to create the first five corner points.



Q&A

Q: Will it take as long to learn the rest of the tools as it does to learn about drawing curves and lines with the pen tool?

A: No. Learning to draw curves may seem difficult because a lot of information is needed to draw a curve. Learning to use other tools is not as complicated.

Q: How can I know ahead of time where to drag my direction points?

A: Once you are used to moving direction points, you will be able to place them almost instinctively just by watching the screen. When you are learning Adobe Illustrator 88, keep the following in mind:

- *Decide on the direction in which you need to drag.* Drag in the direction of the bump on the curve. For an upward curve, drag up; for a downward curve, drag down.
- *Decide how large a curve you want.* Imagine that the final curve is stretched out flat in a straight line. You should drag your direction point about one-third of the straight-line length of the curve.
- *Decide on the angle of the direction points.* Imagine that you are butting a ruler up against the curve and that the ruler is tangent to the curve at its anchor point. Drag your direction point along the angle of the ruler.

Q: How do I decide where to set anchor points?

A: Set anchor points at the beginning and end of each bump or curve, rather than on the top or the bottom of a curve. Keep anchor points to a minimum to save drawing time and computer memory.

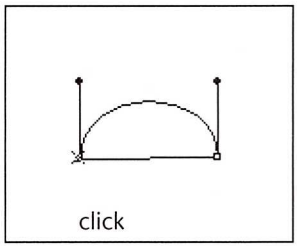
Q: How do I know when I need a corner point?

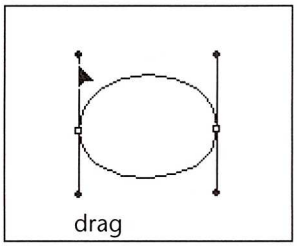
A: You need a corner point when you use the pen tool to add a curve to an existing line or a line to an existing curve. You also need to create a corner point when adjacent curves extend in different directions or are different sizes or shapes.

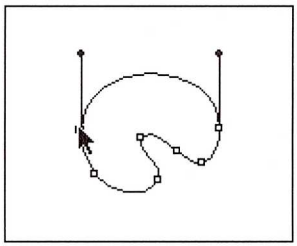
Lesson 5: *Creating Closed Paths*

Overview

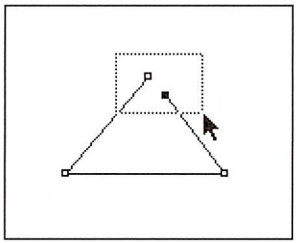
Creating Closed Paths

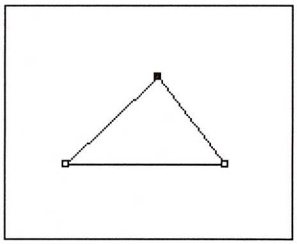






Average and Join





Also in this lesson:

- Zooming in
- Zooming out
- Verifying that paths are closed

Creating Closed Paths

Lessons 1 through 4 demonstrated how to create simple paths with both the freehand and pen tools. You can use either tool to add segments to an existing path. You can also use either tool to create a closed path. Closed paths are loops and have no endpoints. The concept of a closed path is important when you are filling areas defined by paths, stroking paths, or modifying paths.

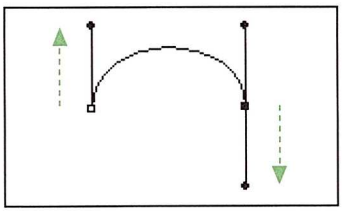
In this lesson, you will practice drawing paths with both the freehand and pen tools, adding segments to existing paths, and creating closed paths. In general, you can create a closed path by ending it on its starting point.

Create an open path and fill and stroke it

If necessary, start the Adobe Illustrator 88 program, click New, and then click None to get a new document. If you have been working with the program and want to erase the contents of an active window, press ⌘-A to select all, and then press the Backspace key.

First, you create a path.

1. Click on the pen tool.
2. Move the pointer to the drawing area.
3. Drag up to set the first anchor point. Release the mouse button.
4. Move the pointer to the right, and drag down to set the second anchor point and create a simple curve. Release the mouse button.

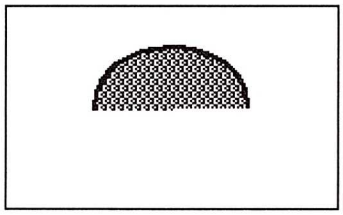


Unlike other graphics programs, the Adobe Illustrator 88 program lets you fill an open path, not just a closed object. You will fill and stroke this open path to see the effect.

Next, you select the path you have drawn.

5. Click on the selection tool.
6. Drag the selection marquee to select the entire path. The anchor points on the path are solid black squares, which indicates that they are selected.
7. Choose Paint from the Style menu.
8. When the dialog box appears, click on Black in the Fill options.

9. Change the Black value to 50 percent by typing 50.
10. In the Stroke Options, click on Black. Change the value to 100 percent if it is not already 100.
11. Set the Weight value to 2.
12. Click OK.
13. Choose Preview Illustration from the View menu to see the results.



You have just filled and stroked the path. The stroke is the black line that outlines the path itself. The shaded area is the fill. As you can see, an open path is filled as if its endpoints were connected with a straight line.

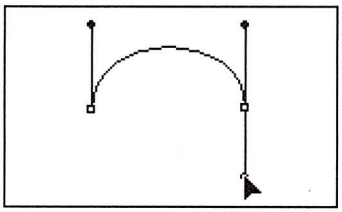
14. Choose Artwork Only from the View menu to continue working.

In the next section, you will learn three ways to close a path. These three methods differ based on the kind of line you want to use to close the path and the tools you use to create the line.

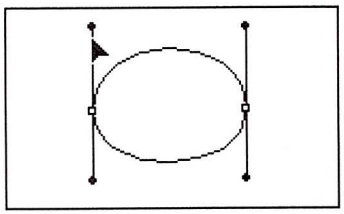
Close a path with a smooth curve

To close the path with a smooth curve, you use the pen tool.

1. Click on the pen tool.
2. Position the pointer over the last (rightmost) anchor point, drag down, and release the mouse button. You are dragging the direction line for the next curve.



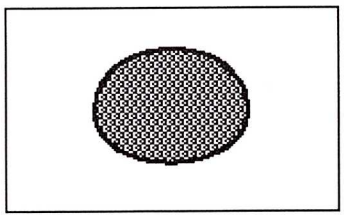
3. Move the pointer so that it is exactly on top of the beginning of the path, and drag up.



The path is now closed.

IMPORTANT: When you place the final anchor point to close the path, the pointer must be within 2 pixels of the original endpoint. Otherwise, you will have created an additional anchor point, and the path will not be closed.

4. Choose Preview Illustration from the View menu to see the results.



5. Choose Artwork Only from the View menu to continue working.

To close a path with a straight line, you can use either the pen tool or the Join command.

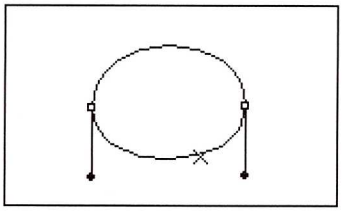
Close a path with a straight line by using the pen tool

First, you will delete the final segment you just created so that you can try closing the path with a straight line.

⌘

1. Hold down the ⌘ key to access the selection pointer, and click away from the drawing to deselect everything.
2. Continuing to hold down the ⌘ key, click on the bottom curved line you just drew to select it.

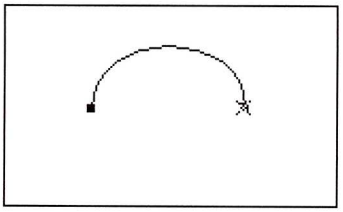
3. Release the ⌘ key.



4. Press the Backspace key to delete the segment. You now have the original open path.

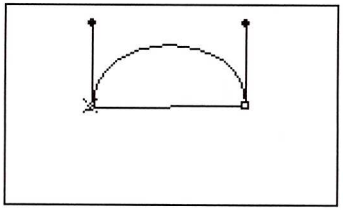
   The pen tool should still be selected.

5. Move the pointer so that it is exactly over the final (rightmost) anchor point in the path.



6. Click the mouse button. *Do not* drag.
7. Move the pointer so that it is exactly over the first anchor point in the path.
8. Click the mouse button.

   The path is closed with a straight line.

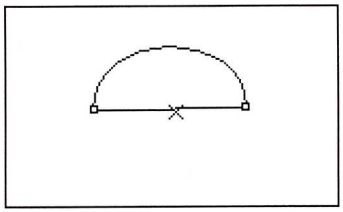


Close a path with a straight line by using the Join command

Another way to close a path with a straight line is to use the Join command. This command creates a straight line between two selected anchor points.

Again, you will delete the final segment you just created so that you can try closing the path with the Join command.

1. Hold down the ⌘ key to access the selection pointer.
2. Click away from the drawing to deselect everything.
3. Click on the line segment you just drew to select it.
4. Release the ⌘ key.



5. Press the Backspace key to delete the segment. You now have the original open path, and the two endpoints are selected.
6. Choose Join from the Arrange menu.

   The path is closed with a straight line.

Close a path by using the freehand tool

When you are drawing with the freehand tool, you can close a path by connecting the two endpoints.

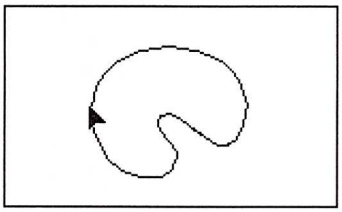
Again, you will delete the final segment you just created with the Join command, so that you can try closing the path with the freehand tool.

1. Using the selection pointer, click away from the drawing to deselect everything.
2. Click on the line segment you just drew to select it.
3. Press the Backspace key to delete the segment. You now have the original open path.

4. Click on the freehand tool in the toolbox.

5. Position the pointer over the rightmost endpoint.

6. Hold down the mouse button, and drag a path until the pointer is over the point where the path begins.



7. Release the mouse button.

Verify that paths are closed

As was mentioned previously, if you want to create a closed path, you must place the final anchor point of the path within 2 pixels of the original anchor point *as you are creating the path*. When you are drawing with the freehand tool, it easy to overshoot the endpoint of the path.

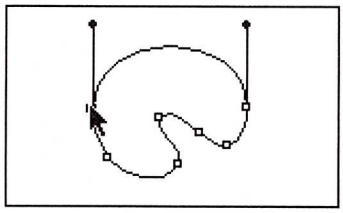
Furthermore, you cannot create a closed path simply by moving an existing anchor point on top of another one. The two points will still be separate. Sometimes you will have one anchor point that is directly on top of another, but the two will not be connected.

The following section explains how to verify that anchor points form a closed path. You will use the freehand path you drew in the previous section as an example.

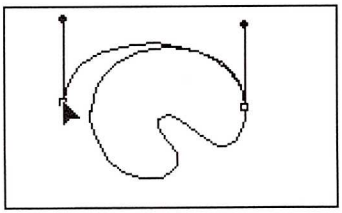
1. Get the selection pointer.

2. Click away from the drawing to deselect everything.

3. Click to select the final anchor point in the path, the one over the point where the path began.



4. Drag the selected anchor point away from its original location.

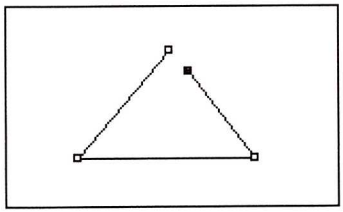


If the path is closed, both lines connected to the anchor point will move along with the anchor point. If the path is not closed, the lines in the drawing will separate from each other, as shown here. In most cases, you will want to close the path. The following section shows you how.

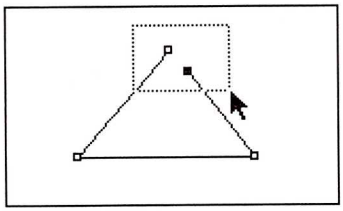
Use the Average and Join commands to close a path

To move and connect two existing anchor points, you can use the Average command and then the Join command.

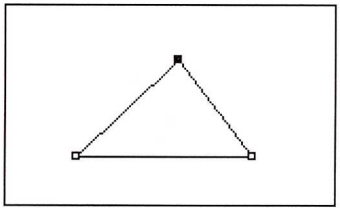
1. Draw an open path with the tool of your choice. Place the endpoints close together, but do not connect them. (In the example, the lines were drawn by clicking with the pen tool.)



2. Use the selection marquee to select the two endpoints you want to connect to make a closed path.



3. Choose Average from the Arrange menu.
4. Click OK in the dialog box to average along both axes.



The Average command moves both selected points to their average location. The anchor points are *not* joined together; they are placed one on top of the other, and both points remain selected.

5. Choose Join from the Arrange Menu.
6. When the dialog box appears, click on Corner Point.
7. Click OK.

   Since the two selected points are coincident (one on top of the other), the program does not need to draw a line between them. They are joined as a single point.

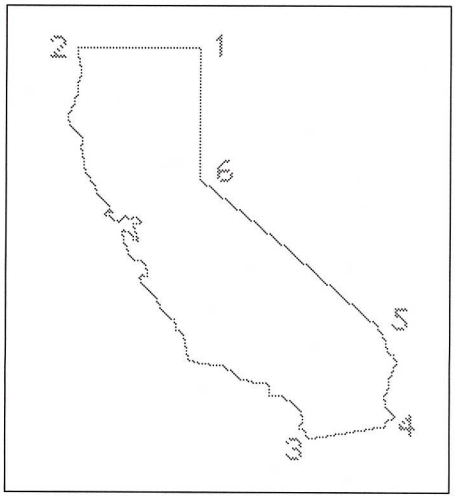
Practice creating closed paths

In this section, you will use both the freehand and the pen tools to create a closed path. You will also use the hand tool to move the template around and the zoom tool to see an enlarged view of the template.

To close the window in which you are currently working, click the close box. If you want to save your artwork, name the file and save it.

Open a template

1. Choose New from the File menu.
2. Locate and open the template named *California Template*.



You can trace the shape of California by using the pen tool to create the straight lines and the freehand tool to create the jagged lines. You begin by drawing the straight line across the northern border.

Draw the northern border

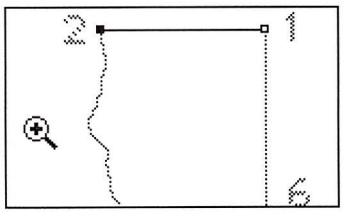
1. Click on the pen tool.
2. Position the pointer on the corner of the border near point 1 on the template.
3. Click to set the first anchor point.
4. Move the pointer to the left over point 2 and click again.

Zoom in on the drawing

Before you trace the coastline, you will zoom in on the template. The zoom tool acts as a magnifying glass. When you zoom in, you see a smaller portion of the drawing in greater detail.

1. Click on the zoom tool (the magnifying glass) in the toolbox.

When you move the pointer to the drawing area, it becomes a magnifying glass with a plus sign in it.



2. Position the pointer near the 2 on the template. Click the mouse button to zoom in on the drawing.

NOTE: The zoom tool magnifies the area around the point where you click with the mouse.

3. Click the mouse button again to zoom in a second level.
4. If you need to reposition the drawing, hold down the Space bar and drag the hand pointer.

Draw the western border

1. Click on the freehand tool.

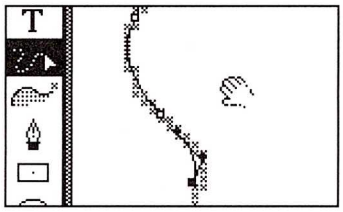
2. Position the pointer directly over the second anchor point (point 2 on the template), hold down the mouse button, and begin tracing down the coastline. Remember that you can hold down the ⌘ key and retrace the dotted path if you want to erase.

3. When you reach the bottom edge of the window, release the mouse button.

   You will need to move the drawing before you can continue.

4. Hold down the Space bar, and move the hand pointer near the bottom of the drawing area.

5. Hold down the mouse button, and drag up to move the drawing.



6. Release the Space bar. The freehand tool should still be selected in the toolbox.

7. Position the pointer over the last anchor point you drew, and continue tracing the coastline. Press the Space bar to use the hand tool when you need to move the drawing.

   When you have completed the path to the bottom of the state, you can reduce the level of magnification.

8. Click on the zoom tool, and move the pointer to the drawing area.

9. Hold down the Option key. The plus sign in the magnifying glass changes to a minus sign, which indicates that you will be reducing the size of the image.

10. Click the mouse button while holding down the Option key. The drawing is reduced in size.

11. Click the mouse button again. The drawing is reduced to its original size.

NOTE: The zoom tool lets you magnify and reduce your drawing through nine different levels by clicking the mouse button. When you reach the highest level, the plus sign inside the magnifying glass disappears, and you must hold down the Option key to obtain the minus sign. When the minus sign is in the magnifying glass, clicking the mouse button reduces the level of magnification. When you want to see a drawing at its original size, you can choose Actual Size from the View menu.

Next, you will switch to the pen tool to draw a straight southern border.

Draw the southern border

1. Click on the pen tool.
2. Click on the last anchor point you drew (near point 3 on the template) to connect the path.
3. Move the pointer to point 4, and click to create a straight line.

Draw the eastern border

1. Click on the freehand tool.
2. Trace up the eastern border. Continue tracing until you reach point 5. Use the hand tool if you need to move the drawing area.

   You will switch to the pen tool to draw the remaining borders.

3. Click on the pen tool.
4. Position the pointer over the last anchor point you drew (near point 5 on the map).
5. Click the mouse button.
6. Move the pointer to point 6, and click the mouse button.
7. Position the pointer over the first anchor point you drew (point 1).
8. Click the mouse button to create the final line in the border.

Verify that the path is closed

1. Click on the selection tool, and then click away from the drawing to deselect everything.
2. Click to select the anchor point at point 1.
3. Hold down the mouse button and drag the anchor point.

   If both borders follow along when you drag the anchor point, the path is closed.
4. Release the mouse button, and choose Undo from the Edit menu to replace the anchor point.

   If the path is not closed, use the Average and Join commands to close it.

   This completes the drawing.

What's next?

Lessons 1 through 5 demonstrate ways to create different kinds of paths. If you want more practice working with closed paths, do the exercises in the "Try It Out" section.

Lesson 6 explains how the Adobe Illustrator 88 program creates layers when you paint objects. You will also learn how to draw circles, squares, ovals, and rectangles.

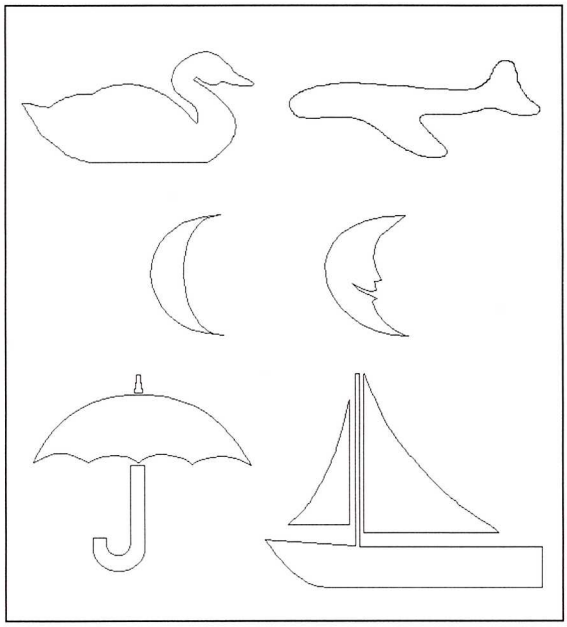
Try it out!

- Try filling and stroking the California map with different shades of gray.

  If you want a simple line drawing, choose None under the Fill options in the Paint dialog box, and enter various line weights after you have chosen Black in the Stroke options.

- Try deleting a segment of the map and redrawing it. You can delete a segment by first selecting it, and then pressing the Backspace key. Redraw the segment with the tool of your choice. Be sure to begin and end on existing anchor points so that the path will be closed.

- Open the template named *Pictures Template*. This template contains shapes you can use to practice tracing and creating closed paths.



- Try drawing the half moon shape with the pen tool. Create a curve; then hold down the Option key and drag the segment to make the other line of the crescent moon. Select the top two anchor points and average and join them. Repeat the process for the bottom two anchor points.

- Try drawing the umbrella with the pen tool. Remember to use the Option key to make corner points along the curves at the bottom of the umbrella. Next, draw the umbrella with the freehand tool, and compare the two drawings to see which you like better.

Q: What's the difference between a closed path and an open path?

A: A closed path is a continuous loop with no beginning or end. An open path has distinct endpoints.

Q: Why would I want to close a path?

A: When you fill an open path, the Adobe Illustrator 88 program draws an imaginary line between the endpoints and fills the path. You may find filled areas where you did not expect them.

Q: If the two endpoints of a path are fairly close to each other, won't I get the same results as if the path were closed?

A: In some cases, you might. However, it is better to join the endpoints to close the path. If you want to enlarge your drawing with the scale tool, for example, the endpoints may move apart.

Q: How can I be sure that a path is closed and that one anchor point is not just on top of the other?

A: Use the selection pointer to deselect everything. Then click on the anchor point about which you are uncertain. Drag the anchor point to see if it is part of a closed path. Choose Undo from the Edit menu to put things back in place.

Q: I moved an existing anchor point directly on top of another one. Does this make the path closed?

A: No. You must use the Join command to close the path.

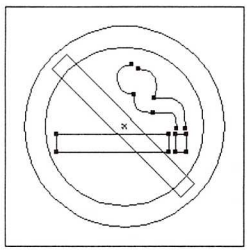
Lesson 6: *Working with Layered Shapes*

Overview

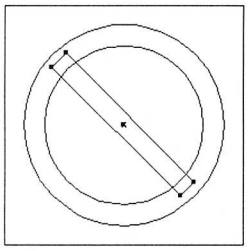
Working with Layered Shapes

1. Layers on top

2. Select and cut



3. Select target object



4. Paste in back

Also in this lesson:

- Drawing squares and circles
- Drawing round-cornered rectangles
- Drawing ovals and rectangles from the center

Working with Layered Shapes

The Adobe Illustrator 88 program provides tools that help you draw rectangles, squares, round-cornered rectangles, circles, and ovals.

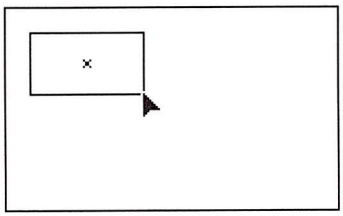
In this lesson, you will use these tools to create filled shapes and practice painting layers on top of one another.

Begin by starting the program and opening a new document with no template.

Draw and paint a rectangle

First, you draw a rectangle.

1. Click on the rectangle tool in the toolbox.
2. Move the pointer to the drawing area. The pointer becomes a cross.
3. Hold down the mouse button and drag. The pointer changes to an arrowhead, and a rectangle is drawn as you drag.



4. Release the mouse button. The pointer changes back to a cross.

   When you release the mouse button, you see five selected anchor points.

NOTE: The Adobe Illustrator 88 program creates a rectangle as two distinct paths that are grouped together. One path consists of four straight line segments connected at the corner points; the second path consists of the single anchor point at the center of the rectangle. When the rectangle is not selected, the center anchor point is displayed as an x. These two paths are *grouped*, which means that the rectangle is a single, distinct unit. If you want to edit a single line in the rectangle, you first need to ungroup it with the Ungroup command in the Arrange menu.

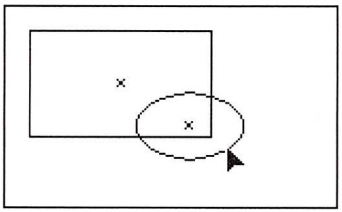
Next, you paint the rectangle.

5. With the rectangle selected, choose Paint from the Style menu.
6. In the Fill options, check the value in the Black field. If the value is not 100, change it to 100.
7. In the Stroke options, click None.
8. Click OK.
9. Choose Preview Illustration from the View menu to see the result.
10. Choose Artwork Only from the View menu to return to the drawing.

Draw and paint an oval

Next, you draw an oval on top of the rectangle.

1. Click on the oval tool in the toolbox.
2. Move the pointer to an area inside the rectangle. The pointer becomes a cross.
3. Hold down the mouse button and drag. The pointer changes to an arrowhead, and an oval is drawn as you drag.



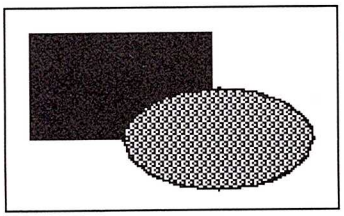
4. Release the mouse button.

   The pointer changes back to a cross.

   When you release the mouse button, you see five selected anchor points. Ovals are grouped paths, just as rectangles are.

Finally, you paint the oval.

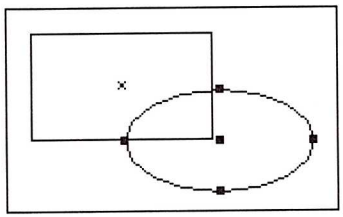
5. With the oval selected, choose Paint from the Style menu.
6. In the Fill options, change the value in the Black field to 50.
7. In the Stroke options, click on Black, leave the value at 100, and set the weight to 1.
8. Click OK.
9. Choose Preview Illustration from the View menu to see the result.



IMPORTANT: The Adobe Illustrator 88 program creates images by applying successive layers of opaque paint to the objects you create in your artwork. Each object has its own paint layer. The first object you create is in the back and is painted first. The next object you draw creates a second paint layer. This layer is painted after the first. If the objects overlap, any stroking or shading in the second layer will completely obscure any portion of the first layer that is behind it. The most recently created layer is in front and is always painted last. The Adobe Illustrator 88 program provides features and commands that help you alter the painting order when you want to.

Change the painting order

1. Choose Artwork Only from the View menu to return to the drawing. The oval should still be selected.



2. Choose Send To Back from the Edit menu.

3. Choose Preview Illustration from the View menu.

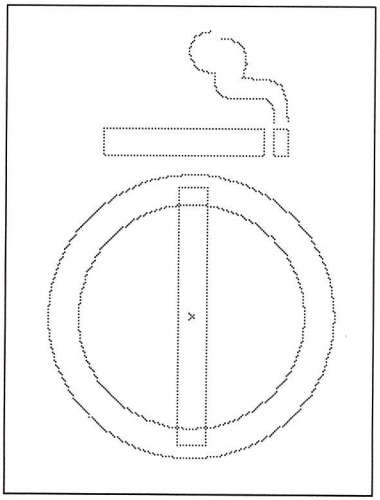
   The oval is in back of the rectangle.

   You can use the Send To Back and Bring To Front commands to move any selected object to the back or to the front of all the other objects in your drawing. Objects in the back are painted first, and objects in the front are painted last.

Create a layered drawing

In this example, you will draw the following symbol:

Begin by closing the window and opening the template named *No Smoking Template*.



Draw and paint the outer circle

1. Click on the oval tool.
2. Move the pointer to the x in the center of the circles.
3. Hold down both the Shift and the Option keys.

Shift Option

4. Drag to the edge of the outer circle to create the circle. *Do not* drag straight across or straight up or down; drag at a slight angle from horizontal.
5. Release the mouse button. Then release the Shift and Option keys.

> NOTE: Holding down the Shift key constrains the oval to a circle. Holding down the Option key allows you to draw circles and ovals from the center out, rather than from edge to edge.

6. With the circle selected, choose Paint from the Style menu.
7. Set the Fill options to 100 percent Black.
8. Set the Stroke options to None.
9. Click OK.

Create the inner circle

1. Using the oval tool, begin at the center anchor point, and hold down the Shift and Option keys to draw the inner circle, just as you did for the outer circle. Release the mouse button before you release the Shift and Option keys.
2. Choose Paint from the Style menu.
3. Set the Fill options to White.
4. Set the Stroke options to None.
5. Click OK.

Create the rectangle

1. Click on the rectangle tool.
2. Move the pointer to the center anchor point.

Option

3. Hold down the Option key, and drag to create the rectangle.
4. Release the mouse button and then the Option key.

5. Click on the rotate tool.

6. Move the pointer to the center anchor point.

Option

7. Hold down the Option key, and click the mouse button.

8. Type 45 after Angle in the dialog box.

9. Click OK.

   This rotates the rectangle 45 degrees. You will learn more about the rotate tool in a later lesson.

10. Choose Paint from the Style menu.

11. Set the Fill options to 100 percent black.

12. Set the Stroke options to None.

13. Click OK.

    Next, you will set up separate artwork and preview windows so that you can watch the results.

Open an additional window

1. Position the pointer in the size box at the lower right corner of the window.

2. Drag the size box to the left until the window fills about half the screen.

3. Choose New Window from the Window menu.

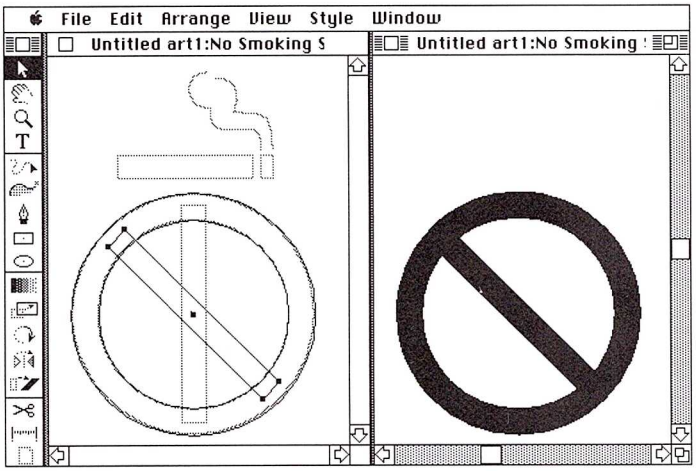
   A second window appears on top of the first window.

4. Drag the size box to the left until the window is the same size as the original.

5. Move the pointer to the title bar, and drag the second window to the right.

6. Choose Preview Illustration from the View menu.

   Your screen should look like this. Use the hand tool to reposition the artwork and the preview image if you need to.



Draw the cigarette

1. Use the rectangle tool to draw the two rectangles that make the cigarette.

2. Select the smaller rectangle and set the fill to 100 percent black. Set the stroke to 100 percent black with a weight of 3.

3. Select the larger rectangle and set the fill to white and the stroke to 100 percent black with a weight of 3.

4. Use the freehand tool to draw the smoke.

5. With the smoke selected, use the Paint dialog box to set the fill to None and the stroke to 100 percent black with a weight of 3.

   To treat the parts of the cigarette as a single unit when you move them, you will select the three objects and group them.

Group the cigarette

1. Move the selection pointer to one of the paths of the smoke.

2. Hold down the Option key, and click the mouse button.

NOTE: Holding down the Option key when you click on a path causes all the anchor points on that path to be selected.

3. Move the pointer to the second path of the smoke.

Option Shift

4. Hold down the Option key and the Shift key.

5. Click the mouse button.

6. Release the keys.

   All the anchor points on both paths of the smoke should be selected.

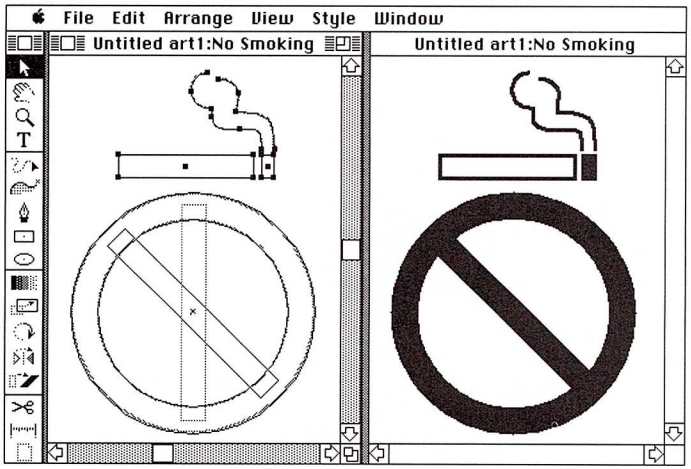
NOTE: You can use the Shift key to select additional objects. As long as you hold down the Shift key, selected objects remain selected, and additional objects you click on are also selected.

Shift

7. Hold down the Shift key, and click on both rectangles of the cigarette.

   All parts of the cigarette should now be selected.

   Be sure that no other objects in the drawing are selected.



8. Choose Group from the Arrange menu.

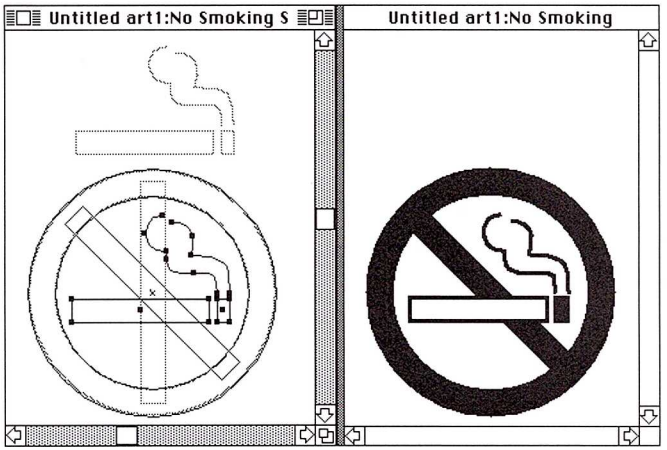
   The selected objects are combined into a group.

   Next, you will move the cigarette to the appropriate layer in the drawing.

Change the painting order

1. Drag the cigarette on top of the symbol.

   Because the cigarette was drawn last, it is the top layer of the drawing, as you can see in the preview window.



   You will move the cigarette behind the crossbar by cutting the cigarette and pasting it back into the drawing in a different painting order.

2. With the cigarette selected, choose Cut from the Edit menu.

3. Use the selection pointer to select the crossbar.

4. Choose Paste In Back from the Edit menu.

5. Check the results in the preview window.

> NOTE: You can paste any object in front of or behind any other object by first selecting and cutting it, and then selecting the target object and choosing Paste In Front or Paste In Back. When you cut the object, it is stored on the Clipboard. Be sure that you paste the object immediately after you cut it. If you perform other operations that use the Clipboard, you will lose the object.

Draw a round-cornered rectangle

To finish the drawing, you will draw a round-cornered rectangle.

1. Click on the rectangle tool.

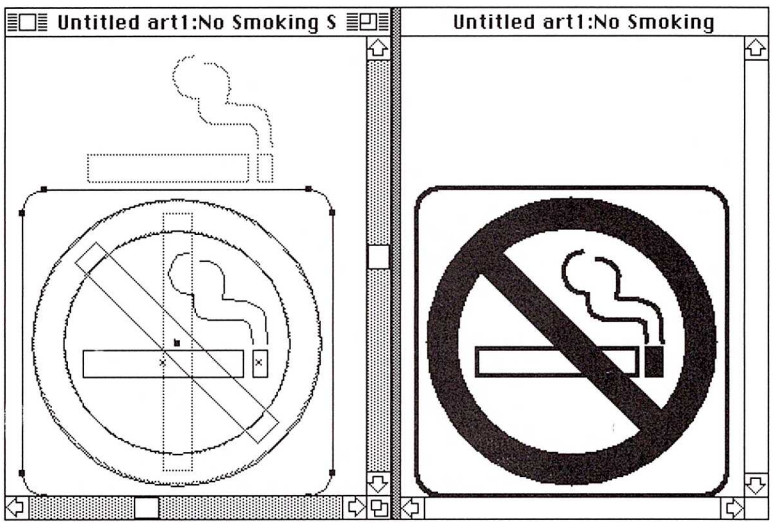
2. Move the pointer to the anchor point in the center of the drawing.
3. Hold down the Option key and click the mouse button.

Option

The Rectangle dialog box appears.

4. Enter a value of 194 points in the Width field. (If you have previously changed the ruler preferences to centimeters or inches, you should use the Preferences dialog box to change them back to picas/points.)
5. Enter a value of 194 in the Height field.
6. Enter a value of 15 in the Corner Radius field, and click OK.

The rectangle is drawn according to the measurements you entered. The rectangle should have the same paint attributes as the last path you painted (the smoke). The fill should be None and the stroke should be 100 percent black with a weight of 3. If you need to change the fill and the stroke of the rectangle, choose Paint from the Style menu.



This completes the drawing.

What's next?

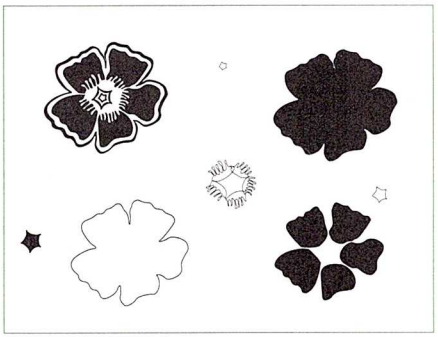
Do the exercises in the "Try It Out" section to practice rearranging painting layers.

Now that you know how to create, paint, and layer paths, you are ready to learn how to work with type. Lesson 7 explains how to add type to your drawings.

Try it out!

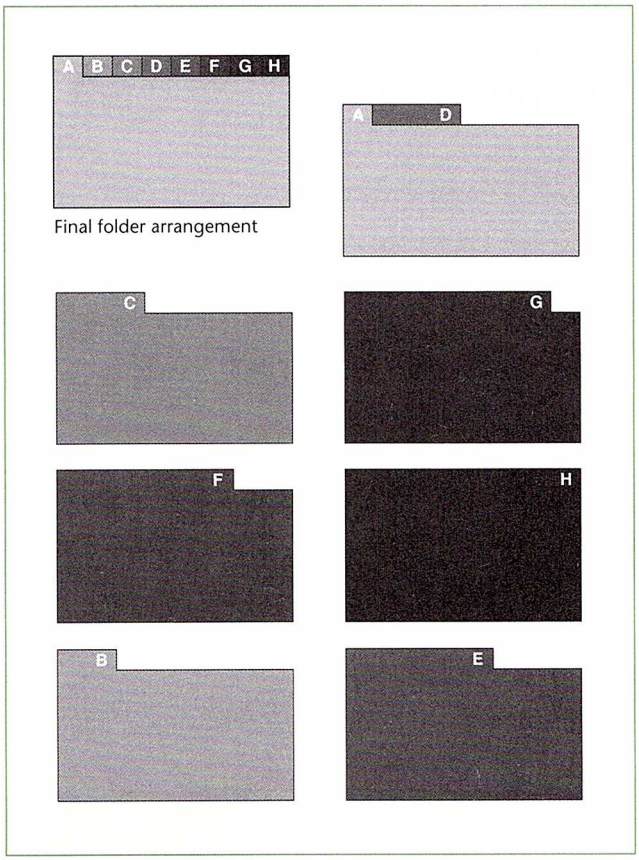
In the Tutorial Folder you will find several artwork files you can use to practice layering artwork.

- Open the file named *Flower Art*.



Rearrange the parts of the drawing to create the layered version of the flower. Open a second window and set it to preview mode, so you can watch the results as you move the layers.

- Open the file named *Filefolder Art*. Rearrange the layers until the folders are in alphabetical order when you preview them.



Q: I painted an object and nothing happened in the preview window. Why?

A: Be sure that the object is selected before you paint it. If no objects are selected, the paint attributes you set will apply only to new objects that you create.

Q: I want to paint several objects with the same fill and stroke attributes. Do I have to select each object and paint it individually?

A: You can select as many objects as you want and then set their attributes in the Paint dialog box.

Q: I selected several objects with different paint characteristics and then opened the Paint dialog box. Which of the selected objects does the dialog box describe?

A: The paint attributes that are common to all selected objects are shown. Attributes that differ are unspecified.

Q: How can I assign the attributes of an existing object to new objects?

A: Select the object whose paint attributes you want to use. Open the Paint dialog box and click OK. Subsequent objects that you create will have those attributes.

Q: How can I paste an object between two other objects?

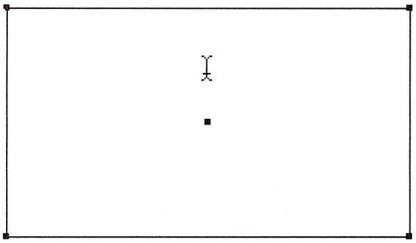
A: First, select the object you want to move and cut it. Then select the object you want to place the cut object in front of. Choose Paste In Front from the Edit menu. If you want to paste the cut object behind the selected object, choose Paste In Back.

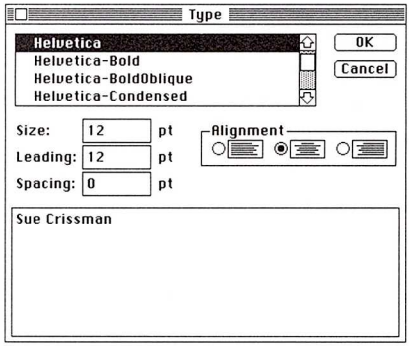
Lesson 7: *Working with Type*

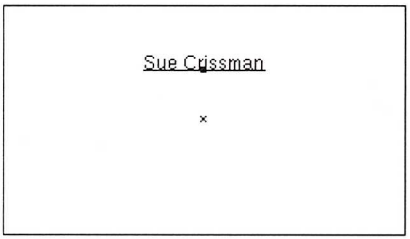
Overview

Working with Type

1. Select 

2. Click 

3. Type 

4. View 

Also in this lesson:

- Setting up rulers
- Changing ruler origin
- Aligning lines of type
- Printing

Working with Type

The Adobe Illustrator 88 program makes it easy for you to enter and edit text. You add text with the type tool and the Type dialog box.

This lesson shows you how to enter and edit text and includes information on aligning text and using rulers.

Create a business card

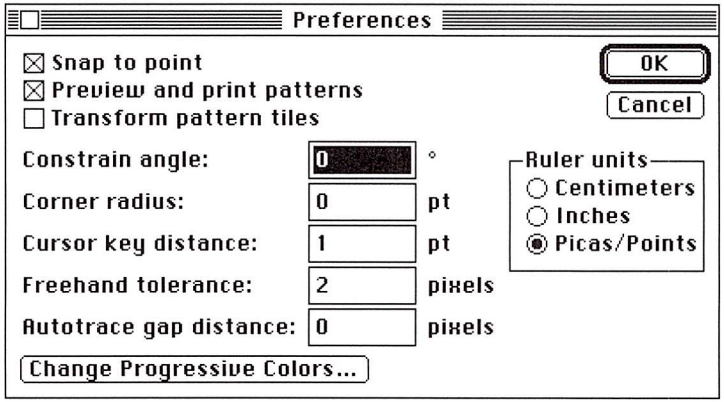
In this example, you will create a simple business card showing your name and address.

1. If necessary, start the program, and open a new document with no template. If you have been using the program, clear the window.

   Before you begin drawing the card, you will change the preferences so that all measurements will be displayed as inches.

2. Choose Preferences from the Edit menu.

   The Preferences dialog box appears. The Preferences dialog box allows you to specify the kind of units the rulers measure.



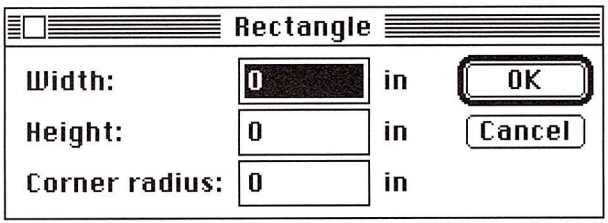
3. Click Inches.
4. Click OK.

Draw the outline of the card

1. Click on the rectangle tool.
2. Position the pointer near the center of the drawing area.
3. Hold down the Option key, and click the mouse button.

Option

The Rectangle dialog box appears. You will use this dialog box to specify the exact dimensions of the rectangle.



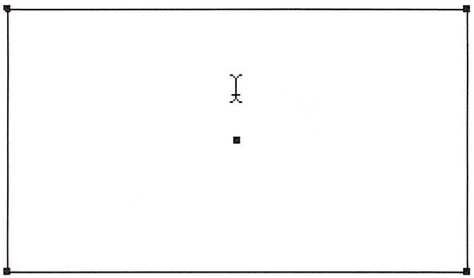
An average business card measures 3.5 by 2 inches.

4. Type 3.5 in the Width field.
5. Type 2 in the Height field.
6. Type 0 in the Corner Radius field.
7. Click OK.
8. With the rectangle selected, choose Paint from the Style menu, and set the Fill options to None and the Stroke options to 100 percent black with a weight of 1.

Add type

1. Click on the type tool.

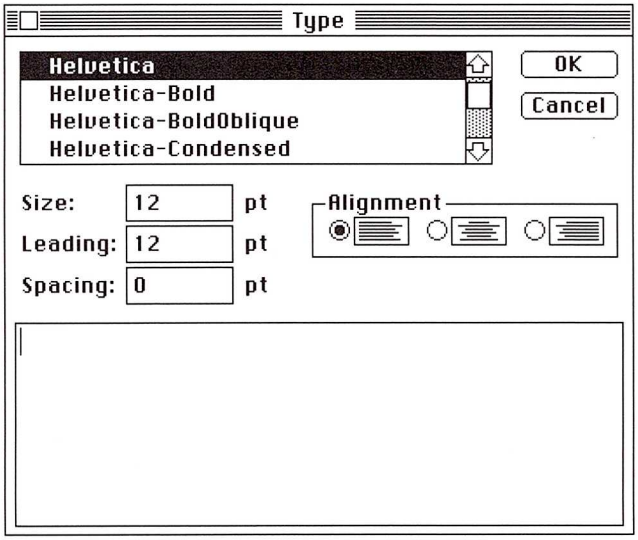
2. Position the pointer between the center anchor point and the top of the rectangle.



This is where the type will be placed. The pointer is an I-beam when the type tool is selected.

3. Click the mouse button.

The Type dialog box appears. You enter text in the text box at the bottom of the Type dialog box, rather than directly in the drawing area. You also use the Type dialog box to choose fonts, font size, and other type characteristics. The blinking insertion point in the text box at the bottom indicates where you type the text.



4. Type your name.
5. Scroll through the fonts and click on Helvetica if it is not already selected.
6. Change the point size to 12 if it is not already 12.
7. Change to center alignment by clicking on the second button (or on the icon itself) in the alignment options.
8. Click OK.

   The Type dialog box disappears, and the type you entered appears in the artwork. The solid black square is the alignment point; the baseline is also indicated. You see the alignment point and the baseline when type is selected.
9. Position the I-beam pointer just below your name, and click the mouse button.
10. Type your street address.
11. Press the Return key.

> NOTE: All the letters you type in the Type dialog box will appear on a single line in the drawing area until you press the Return key.

12. Type your city, state, and zip code.
13. Change the type size to 9 point.
14. Click OK.
15. In the drawing area, position the I-beam pointer to just below your city, state, and zip code.
16. Click the mouse button, and type your telephone number in the Type dialog box.
17. Click OK.
18. Choose Preview Illustration from the View menu to see the results.
19. Choose Artwork Only to continue working.

Move existing type

Suppose that you want to move the address to the bottom left corner.

1. Hold down the ⌘ key to access the selection pointer.

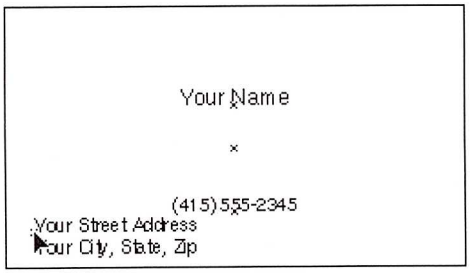
2. Click to select the address. You select type by clicking on its baseline.

   When the type is selected, the alignment point is solid, and you see the baseline.

3. Choose Type from the Style menu.
4. Click the leftmost alignment option (flush left).
5. Click OK.

   The type is now realigned so that it is flush left with the alignment point.

6. Hold down the ⌘ key to access the selection pointer, and drag the type to a new position.



Repeat the previous procedure to move the phone number to the bottom right. Be sure to open the Type dialog box and change the alignment option to right alignment.

Print the card

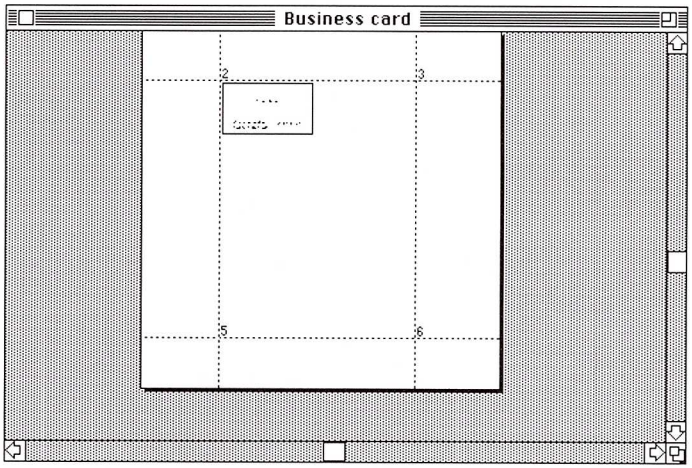
Before you print the card, you will duplicate it.

1. Choose Fit In Window from the View menu.

   The window displays a reduced version of the entire drawing area. The page numbers indicate how the pages will be subdivided by your particular printer. Notice that the business card is on page 5.

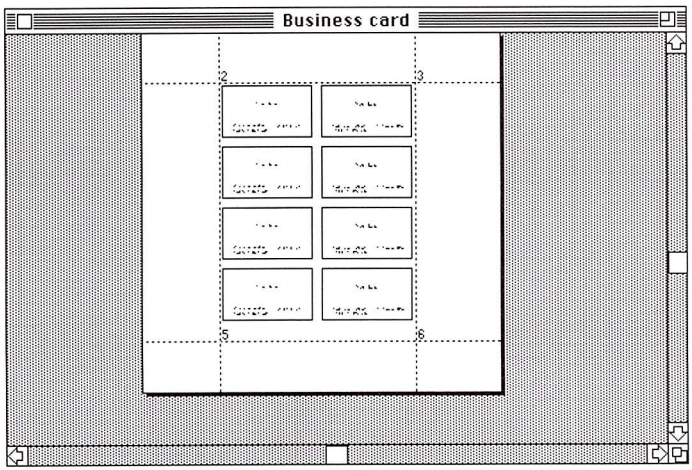
⌘

2. Hold down the ⌘ key to access the selection pointer, and drag to select the entire business card.
3. Drag the card until it is in the top left corner of page 5.



4. Drag the card to the right, and hold down the Option key to make a copy of the card. You now have two copies at the top of page 5.
5. Use the selection pointer to select both copies of the card.
6. Drag down, and hold down the Option key to duplicate the copies. You now have four copies of the card.
7. Choose Transform Again from the Arrange menu.

8. Choose Transform Again a second time. You now have eight copies of the card.



9. Choose Print from the File menu.

   Depending on your printer, you will be asked to fill in various options, including which pages you want printed. In this case, you need to print only page 5.

> NOTE: You can use the entire drawing area for printing if you want to. In general, your printer will only print pages on which you have created artwork. Sometimes, if the artwork is very close to the edge of page 5, your printer may produce an extra blank page.

10. Click OK when you are finished.

Construct a business-reply postcard

In the following example, you will enter type and learn how to align it.

Customer Information

Name _____
Title _____
Company _____
Address _____
City _____
State & Zip _____
Telephone _____
Date Product Purchased _____

Set up the rulers and ruler origin

1. Begin with a new document with no template.

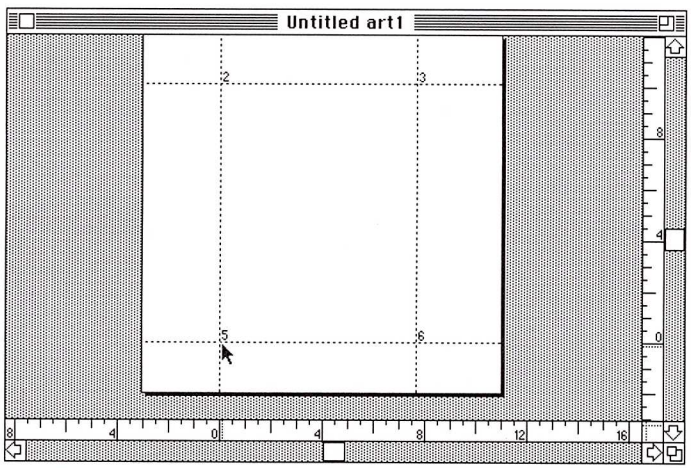
   Before you create the card, you will set up the rulers so that you can measure the size of the card.

2. Choose Show Rulers from the View menu.

   The rulers appear along the bottom and on the right side of the document window.

3. Choose Fit In Window from the View menu.

   The view changes to show the entire document.



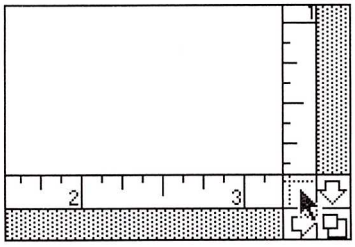
4. Move the pointer around the window, and notice the dotted lines that move along the rulers. These ruler indicators show the exact location of the pointer.

5. Position the pointer where the dashed lines on the screen intersect near the 5.

   Notice that the ruler indicators are both at 0. This point on the drawing, the place where both ruler indicators are at 0, is called the *ruler origin.* Although the Adobe Illustrator 88 working area is 14 by 14 inches, the preset ruler origin is at the bottom of a standard page. You can change the ruler origin to make measuring easier.

6. Choose Actual Size from the View menu.

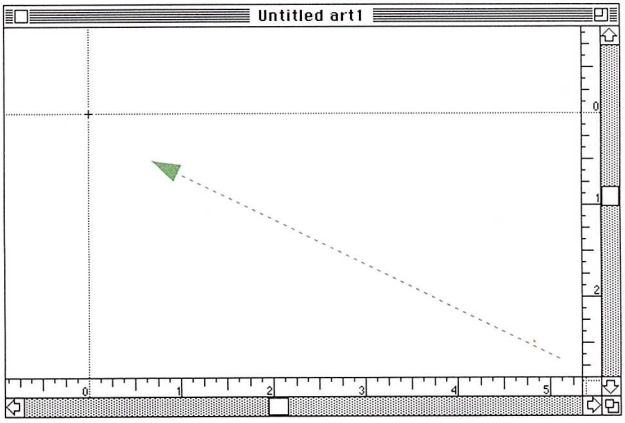
7. Move the pointer to the box in the lower right corner where the rulers intersect.



8. Hold down the mouse button, and drag into the window. Two intersecting lines follow the pointer. The intersection of these lines will indicate the ruler origin.

9. Drag the origin until the pointer is near the top left of the screen.

10. Release the mouse button. The ruler origin changes to the point at which you released the mouse button.



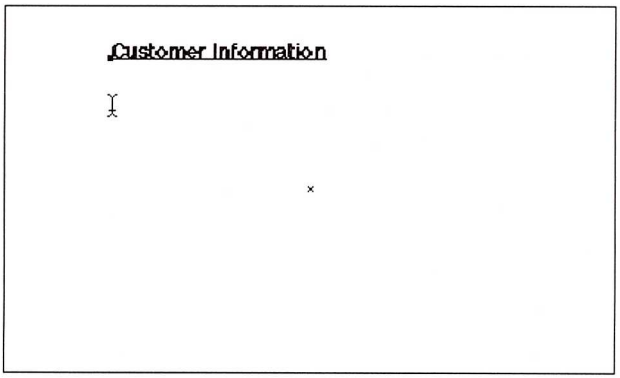
11. Move the pointer around the window and notice the dotted lines that move along the rulers. These ruler indicators show the exact location of the pointer.

Draw the outline of the card

1. Select the rectangle tool, and move the pointer to the ruler origin, so that the ruler indicators are both at 0.
2. Hold down the mouse button, and drag down and to the right until the rectangle is 5.75 inches wide and 3.5 inches high. Release the mouse button.
3. Use the Paint dialog box to set the Fill options to None and the Stroke options to 100 percent black with a line weight of 1.

Add type

1. Select the type tool.
2. Position the I-beam so that it is 1 inch in from the left border, and 1/2 inch down from the top border, and click the mouse button.
3. Type Customer Information.
4. Set the type to 14-point Helvetica Bold, aligned left. Click OK.
5. Position the I-beam pointer so that it is 1 inch down from the top and 1/2 inch in from the left border. Click the mouse button.



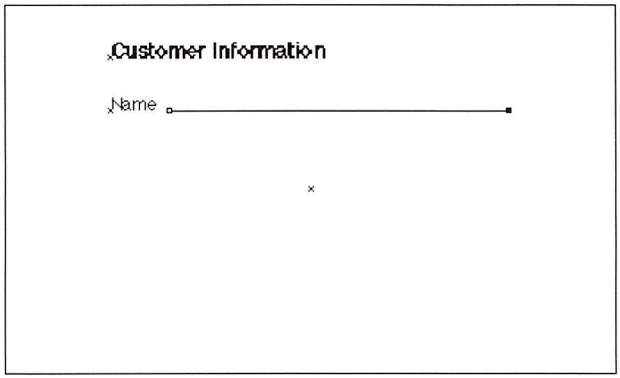
6. Type Name.
7. Set the text to 12-point Helvetica. Click OK.

Create evenly spaced lines

1. Click on the pen tool.

2. Position the pointer slightly to the right of the word "Name" near the baseline, and click.

3. Position the pointer near the right edge of the rectangle (about 3/4 inch in from the edge), and hold down the Shift key. Click the mouse button to create a straight line similar to the one shown in the figure.



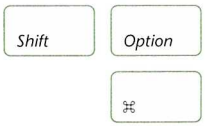
To add lines that are aligned vertically and are evenly spaced, you will duplicate the "Name" line and then edit the text and adjust the lines as needed.

4. Hold down the ⌘ key to access the selection pointer.

5. Drag to select both the word "Name" and the line.

6. Position the selection pointer on the baseline.

7. Hold down the mouse button, and begin dragging downward.



8. Hold down the Shift key and the Option key, as well as the ⌘ key.

9. Continue dragging until the new line is aligned at 1.25 inches on the card.

   The Shift key constrains the movement vertically so that the objects do not move to the left or to the right. The Option key makes a copy of the objects.

10. Release the mouse button. Then release the keys.

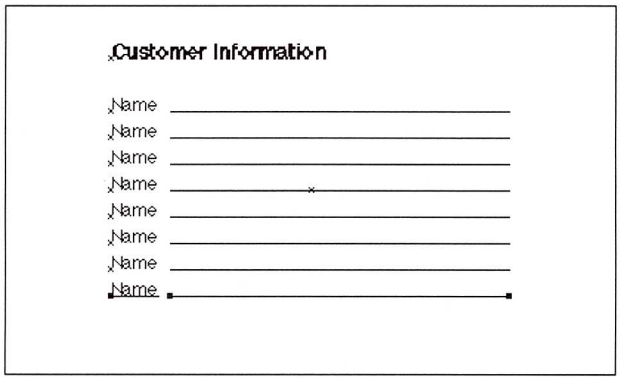
11. Choose Transform Again from the Arrange menu. A second copy of the objects appears below the first.

⌘

12. Hold down the ⌘ key and press D. This is the equivalent of choosing Transform Again.

    A third copy appears.

13. Press ⌘-D four more times to add four more duplicated name lines. The lines are aligned vertically and are evenly spaced. Now that the lines are properly placed, you can change the text.

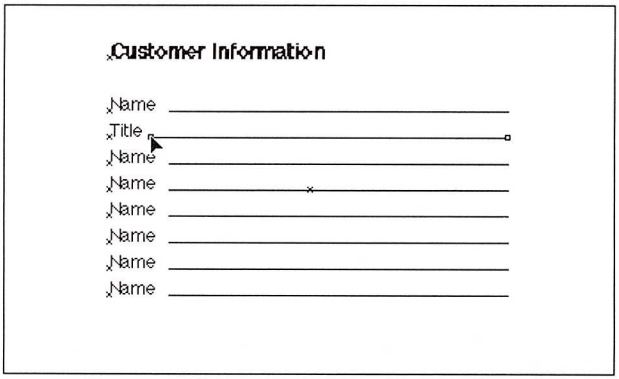


Edit the text

1. Using the selection pointer, click on "Name" in the second line to select it. Remember that type is selected when you see the baseline and the alignment point is solid.
2. Choose Type from the Style menu.
3. Type Title, and click OK.
4. Using the selection pointer, click on the anchor point at the end of the line next to the word "Title."

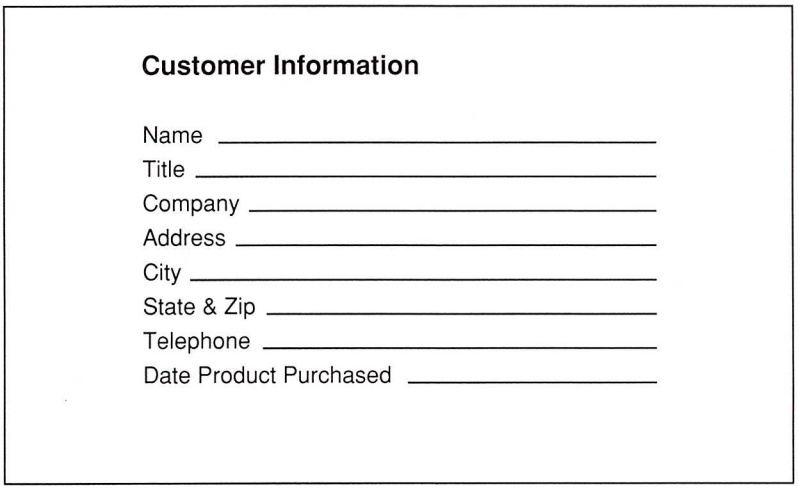
Shift

5. Begin dragging, hold down the Shift key, and drag to the left until the line is the right length.



6. Edit the rest of the lines the same way. Change the third line to "Company," the fourth to "Address," and so on. Be sure to adjust the line lengths as needed.

   This completes the card. Save or print it if you wish.



What's next?

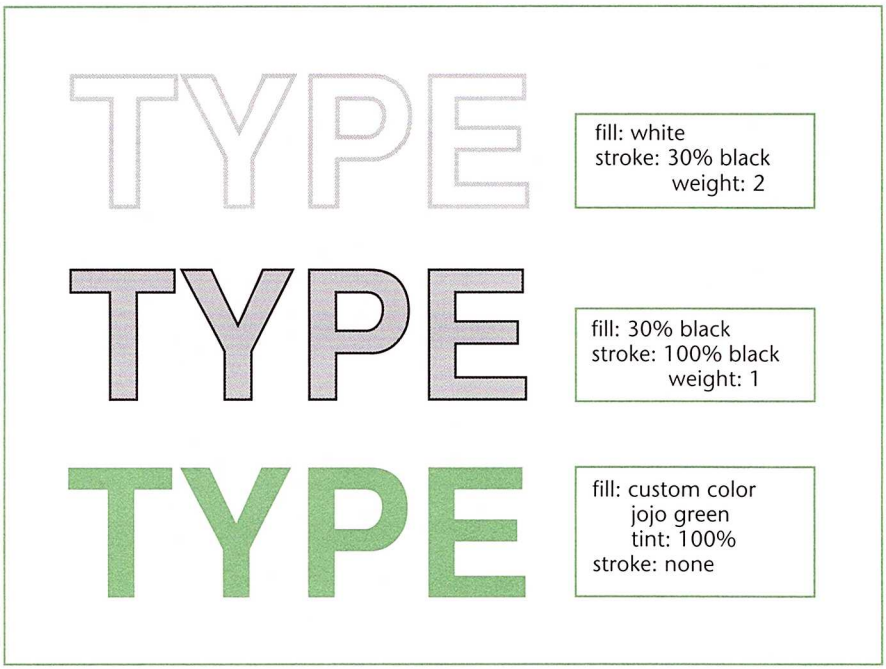
For more practice in working with type, do the exercises in the "Try It Out" section.

The next lesson explains how to use the Adobe Illustrator 88 transformation tools to scale, rotate, reflect, shear, and blend objects.

Try it out!

- Type can be both filled and stroked.

  Type some text and try different stroke and fill options.



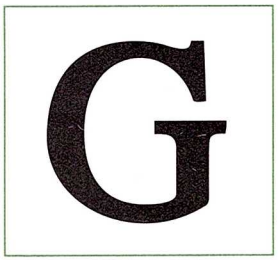
- Try entering different numbers in the Spacing field in the Type dialog box. Negative numbers move type closer together.

- Type several lines of text in the Type dialog box. Try various leading options, and see how the baselines are spaced in the drawing area.

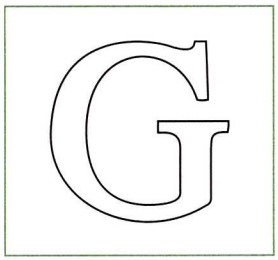
■ Try creating an inline effect by layering several letters and making each layer slightly smaller than the previous one. Follow these steps.

1. Create the first letter. Type a letter G in Times Roman, 100 points. Fill and stroke the letter with 100 percent black, and set the weight to 4.
2. Create a second identical letter on top of the first by choosing Copy from the Edit menu and then choosing Paste In Front from the Edit menu.
3. Fill and stroke the second letter with white, using a line weight of 2. This makes the white letter slightly smaller than the original black letter.
4. Create a third letter on top of the first two by choosing Copy from the Edit menu and then choosing Paste In Front from the Edit menu.
5. Fill the third letter with black, but do not stroke it. The third copy is slightly smaller than the second, white copy.
6. Print the results.

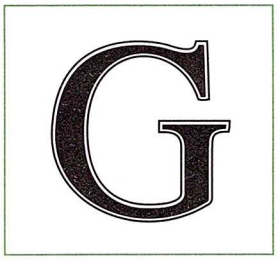
The figures show the results as if each step were printed, because this kind of type effect does not display well on your screen in preview mode.



step 1



step 3



step 5

Q&A

Q: How do I edit existing type?

A: Select the type, and then choose Type from the Style menu. You edit type in the dialog box, rather than in the drawing area.

Q: Is there a limit to how much text I can enter?

A: Yes. You can enter up to 254 characters in the Type dialog box.

Q: Type on my screen looks to be of a very poor quality, even in preview mode. Will it look this bad when I print?

A: No. The printed results will be far superior to the bit-mapped screen fonts you see on the screen.

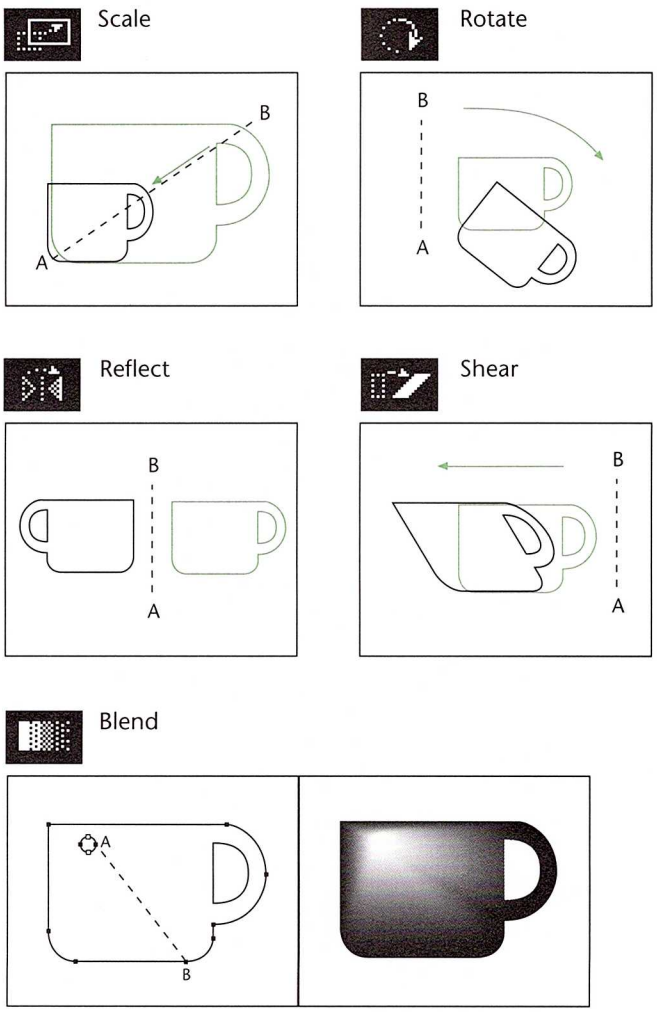
Q: How can I get a single word in a line of type to be in boldface?

A: You must type the word as a separate block of type.

Lesson 8: *Using the Transformation Tools*

Overview

Using the Transformation Tools



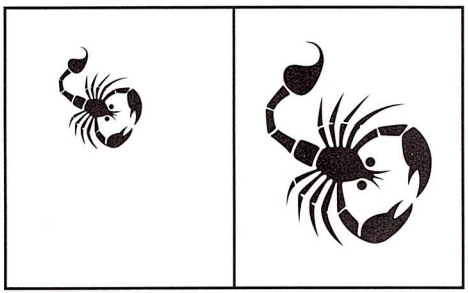
Also in this lesson:

- Using the page tool
- Creating a shadow

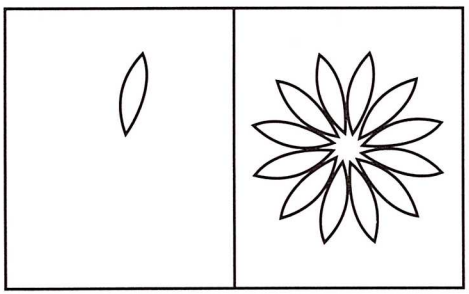
Using the Transformation Tools

The Adobe Illustrator 88 program provides a set of powerful tools that help you transform objects once you have created them.

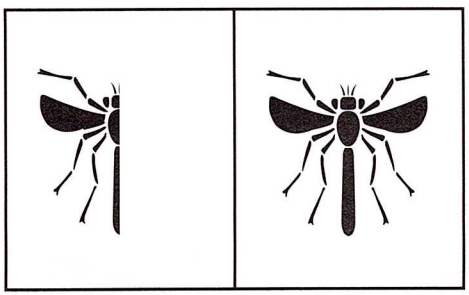
The scale tool lets you resize objects by stretching or compressing them relative to a fixed point or origin that you choose.



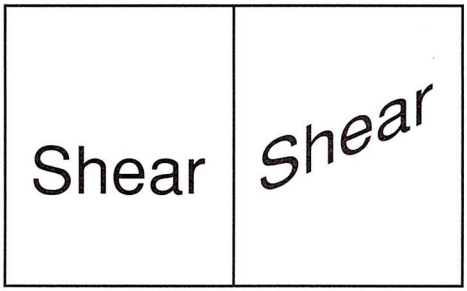
The rotate tool rotates an object around a fixed point that you choose called the *center of rotation*. Duplicating while rotating is a useful method for creating radially symmetrical objects, such as petals of a flower or spokes of a wheel.



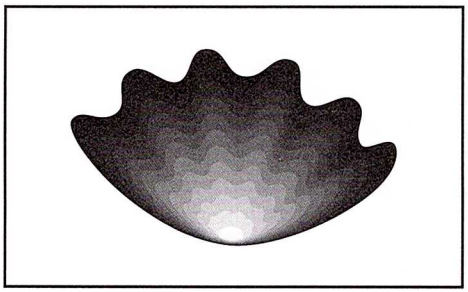
The reflect tool makes a mirror image of an object by reflecting it across an arbitrary line.



The shear tool slants or skews an object uniformly along an axis.



The blend tool lets you design a variety of special effects by creating a series of transformations between two different paths. You can blend shapes as well as shades of gray, process color, or custom color.

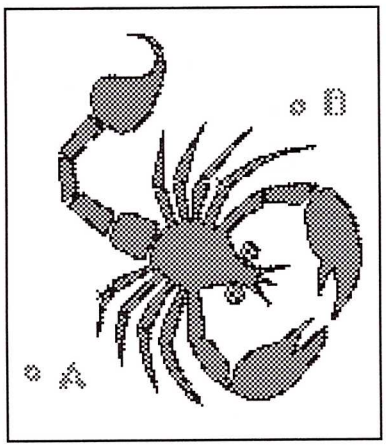


In this lesson, you will practice using these transformation tools. You will also learn to use the page tool.

Scaling

Some of the artwork you will use in this lesson already exists in files provided with the program. If you want to keep the original artwork, be sure to save the copies that you modify under a different name, using the Save As command.

Open the file named *Scorpion Art* in the Tutorial Folder.



This file contains both a template and artwork. When you are working, you will sometimes want to see only the artwork or only the template.

1. To view the template without the artwork, choose Template Only from the View menu. The artwork disappears, and you see the template.
2. To view only the artwork, choose Artwork Only from the View menu. The template disappears, and you see only the artwork.
3. To view both the artwork and the template, choose Artwork & Template from the View menu.

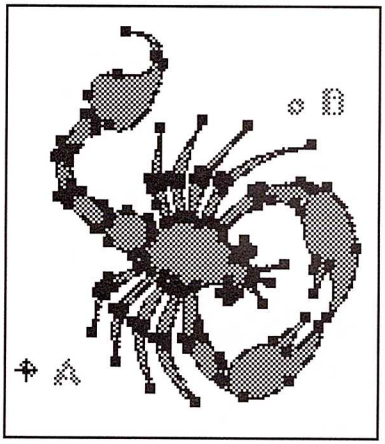
Once you have created artwork, you might want to use it in a variety of different sizes. A company logo, for example, can be resized to fit on promotional materials, letterhead, or a business card.

Scale the object to a larger size

1. Hold down the Space bar and use the hand tool to scroll until the object is at the center of your screen.
2. Use the selection pointer to drag the marquee until the entire object is selected.

3. Click on the scale tool.

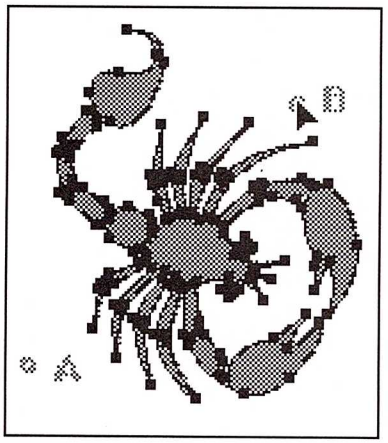
4. Move the pointer to position A. The pointer is a dotted cross.



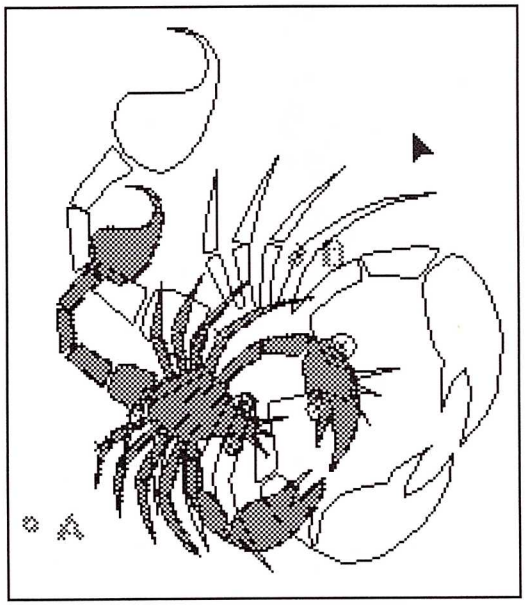
5. Click the mouse button once. The pointer changes to an arrowhead.

   When you click the mouse button after selecting the scale tool, you are setting the *scale origin*. This is the point from which the object will be scaled, and it does not appear on your screen.

6. Move the pointer above and to the right of the object to point B. Hold down the mouse button.



7. Slowly drag up and to the right. As you drag away from the origin, the object stretches in the direction you drag. You can see the original object as well as the scaled object.



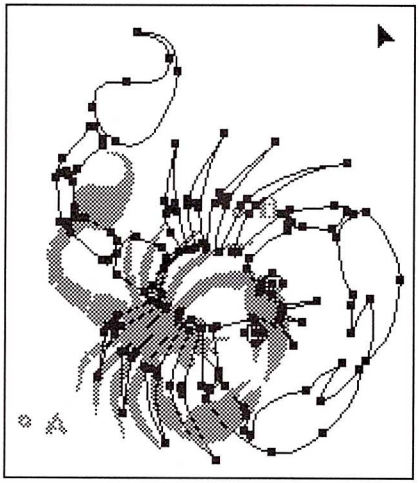
8. Release the mouse button.

NOTE: The selected object is scaled from the invisible scale origin where you first clicked. Imagine that the object is placed on a piece of paper that is held down at the origin where you clicked. Moving the pointer to the right stretches the object horizontally; moving the pointer upward stretches the object vertically. Moving the pointer along a 45-degree angle scales equally in both directions, keeping the object in proportion. To constrain the scaling, you can hold down the Shift key.

Scale the object to a smaller size

1. Be sure that the object and the scale tool are both selected and that the pointer is in the form of a dotted cross.
2. Move the pointer to point A.
3. Click the mouse button once to set the scale origin.

4. Move the pointer above and to the right of the object.



TIP: To have finer control over your scaling, position the pointer farther away from the origin, rather than closer to it, before you begin dragging. The closer you place the arrowhead to the origin, the more sensitive the program is to minute movements of the mouse.

5. Hold down the mouse button.

Shift

6. Hold down the Shift key to constrain the scale.

7. Slowly drag down and to the left. As you drag toward the origin, the object gets smaller.

   Dragging away from the origin stretches the selected object; dragging toward the origin compresses the selected object.

8. Release the mouse button and then the Shift key.

Scale using the dialog box

You can also scale an object with the Scale dialog box. First, you set the origin, and then you enter information in the dialog box.

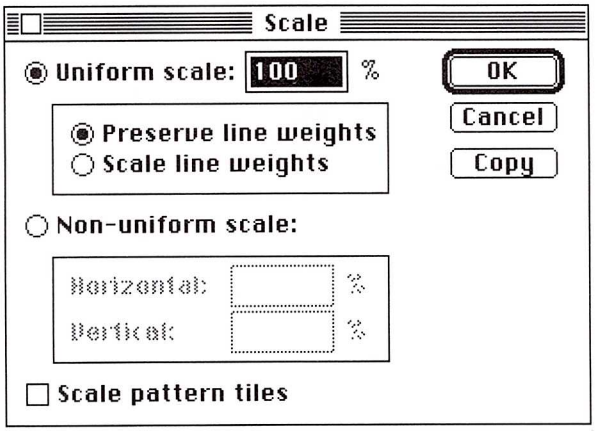
1. With the object and scale tool selected, move the dotted cross to where you want to set the origin. *Do not* click the mouse button.

Option

2. Hold down the Option key, and click the mouse button.

The Scale dialog box appears.

This dialog box allows you to specify the exact percentage by which the object will be scaled. A uniform scale will scale the selected object proportionally.



3. Click on the Uniform Scale button, if it is not already selected.
4. Type 200 in the Uniform Scale field, and click OK. The object is enlarged to twice the size of the original.

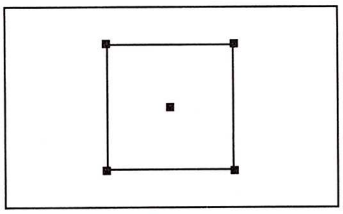
Make copies of scaled objects

Any time you scale, you can make a copy of the scaled object. You will copy a scaled square to create several concentric squares.

1. Use the hand tool to scroll to a clear area on your screecn.

Shift

2. Select the rectangle tool, hold down the Shift key, and draw a large square.



3. Click on the scale tool.

4. Click in the center of the square to set the scale origin.

Shift

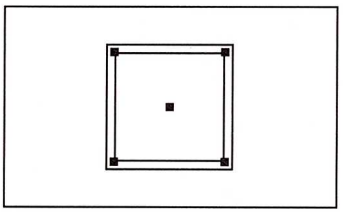
5. Move the pointer to one of the corners, hold down the Shift key to constrain the scale, and drag to create a slightly smaller square inside the original square.

Option

6. Still holding down the mouse button and the Shift key, press the Option key.

7. Release the mouse button and then the two keys.

   The scaled version is copied inside the original square.



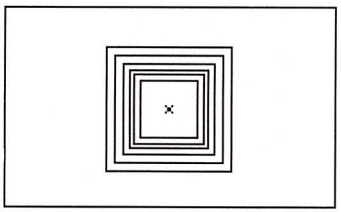
Make a mistake?

If you did not press the Option key before you released the mouse button, you will not have a copy of both squares. Choose Undo from the Edit menu to go back to the original square, and then repeat the scaling process.

Next, you repeat the transformation.

8. Choose Transform Again from the Arrange menu.

   A smaller square appears inside the two outer squares. You can repeat the transformation as many times as you want.



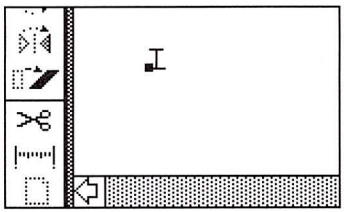
NOTE: If you want to save your scaled squares, use the Save As command to rename the file so that you preserve the original artwork file.

Scale some type

You can also use the scale tool to scale type.

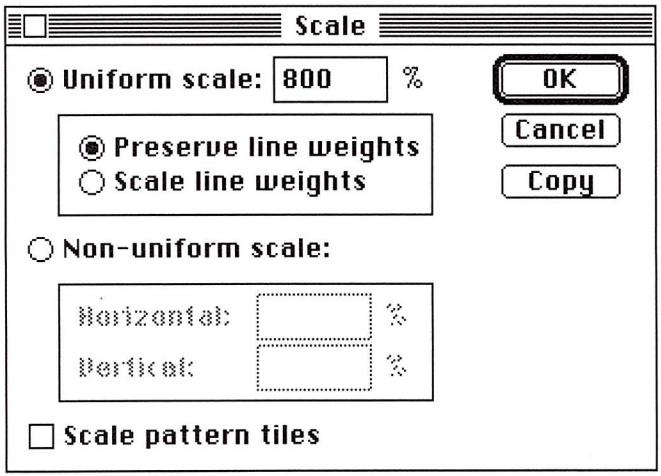
1. Close the file named *Scorpion Art*.
2. Open a new document with no template.

3. Click on the type tool, set an insertion point near the bottom left of the screen, and type a capital T in the text area of the Type dialog box.
4. Click OK.

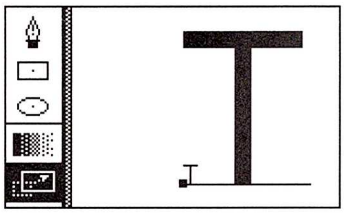


5. With the letter selected, click on the scale tool, and move the pointer to the alignment point of the letter.

6. Hold down the Option key, and click the mouse button. The Scale dialog box appears.
7. Change the Uniform Scale value to 800, and click Copy.



Wait for the transformation to occur.

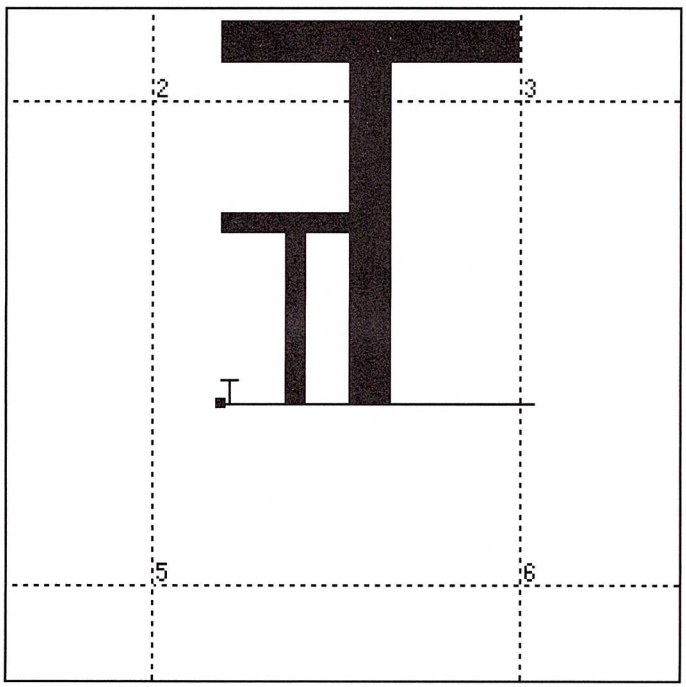


The letter is now eight times larger than the original.

8. Choose Transform Again from the Arrange menu, and wait for the transformation. The type is copied and again increased 800 percent in size.

9. Choose Fit In Window from the View menu. You can now see the entire letter.

   When you choose Fit In Window, you see the entire Adobe Illustrator 88 drawing area, a square that measures 14 by 14 inches. The dotted lines of the grid indicate how the drawing area will be broken into pages for your particular printer, and the numbers indicate page numbers. You can change where pages will be broken with the page tool.

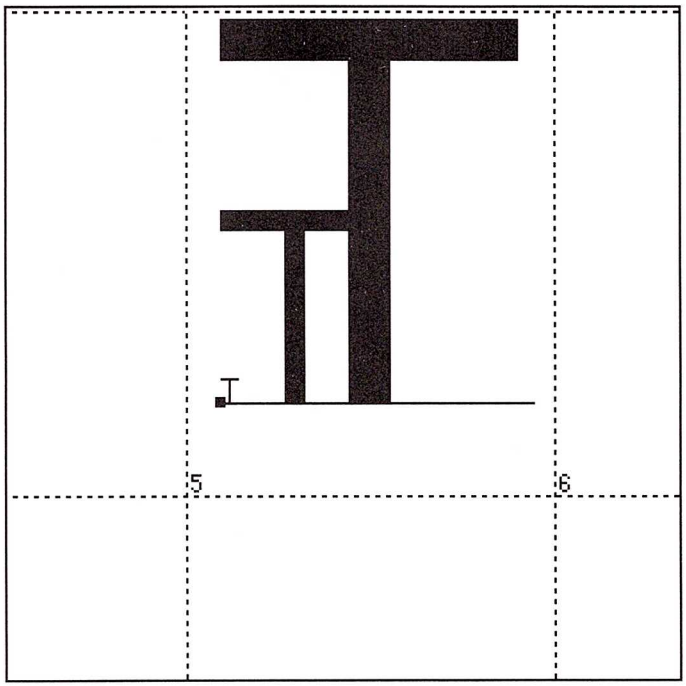


10. Click on the page tool.

11. Move the pointer to the drawing area (the pointer becomes a dotted cross), and hold down the mouse button. A dotted rectangle indicates the printable surface of a single page.

12. Drag the rectangle until it encloses the letters. Release the mouse button.

    The page grid is redrawn so that the letters are on a single page.

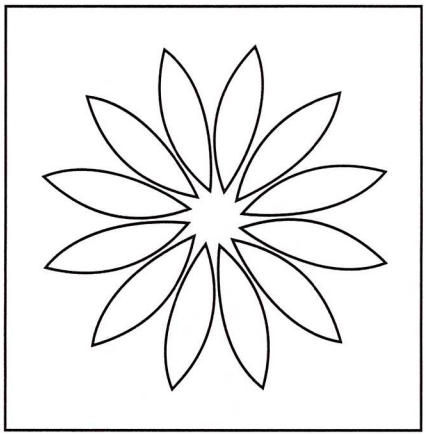


NOTE: If you want to make blocks of type (or drawings) that are even larger and you have a LaserWriter printer, you can use the Page Setup command in the File menu. Using the Reduce or Enlarge field, you can increase the percentage of enlargement even more. (You can also reduce the document by specifying a value less than 100.) After you do this, you will see the pages of your document subdivided accordingly.

Rotating

The Adobe Illustrator 88 program rotates a selected object or objects around a fixed point that you specify; this point is called the *center of rotation*.

In the following example, you will create, rotate, and duplicate a petal to create a flower.

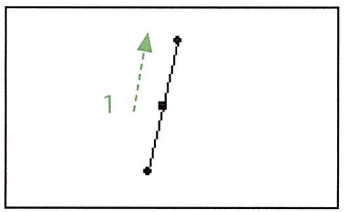


Draw a petal

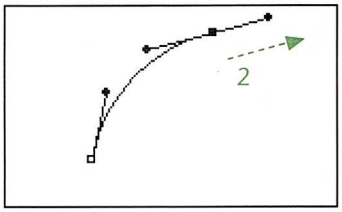
1. Open a new document with no template. (If you have just completed the previous exercise, you can choose Select All and then press Backspace to clear the screen.) Be sure to choose Actual Size from the View menu to return the drawing area to actual size.

2. Click on the pen tool.

3. Set the first anchor point and drag. (Follow arrow 1.)

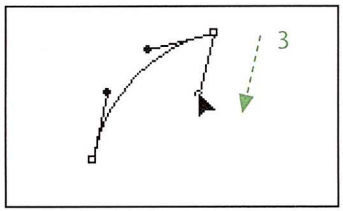


4. Drag to set the second anchor point and direction line. (Follow arrow 2.)



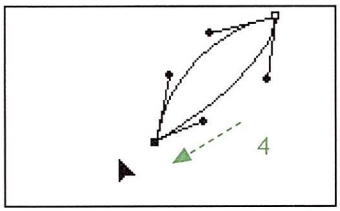
Option

5. Hold down the Option key, position the pointer over the second anchor point, and drag down. (Follow arrow 3.) Release the mouse button.



Option

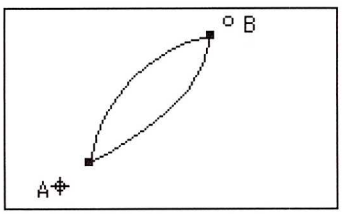
6. Move the pointer to the first anchor point, hold down the Option key, and drag. (Follow arrow 4.)



Rotate and copy the petal

1. Click on the rotate tool. Be sure the petal is still selected.

2. Move the pointer to a point below and to the left of the petal, near point A in the figure. The pointer becomes a dotted cross.

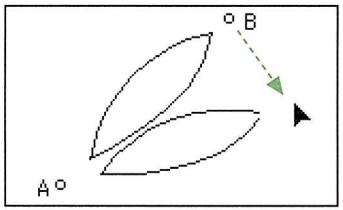


3. Click to set the point that will serve as the center of rotation. The pointer changes to an arrowhead.
4. Move the pointer to a point above and to the right of the petal, near point B in the figure.
5. Hold down the mouse button.
6. Press the Option key.

Option

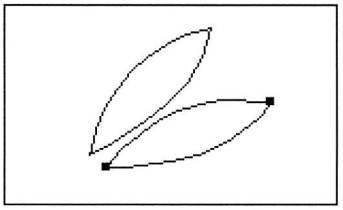
When you press the Option key, you are creating a rotated copy of the original object.

7. Drag down until the petal is rotated into a new position.

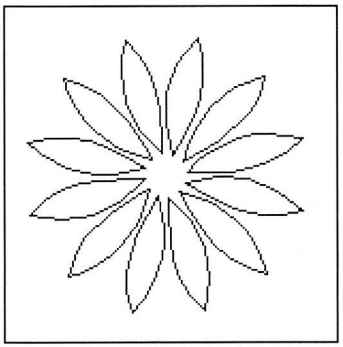


8. Release the mouse button. Then release the Option key.

The petal is both rotated and copied. The copy remains selected.



9. Press Command-D to repeat the transformation as many times as you want.



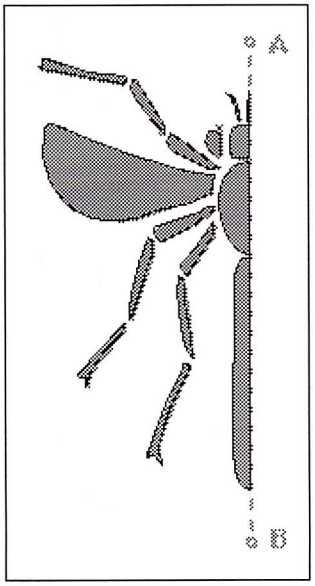
NOTE: You can also specify a rotation angle in the Rotate dialog box by selecting the rotate tool and holding down the Option key while you click to set the center of rotation.

Reflecting

The reflect tool lets you make a mirror image of an object by reflecting it across an arbitrary line called the *axis of reflection*.

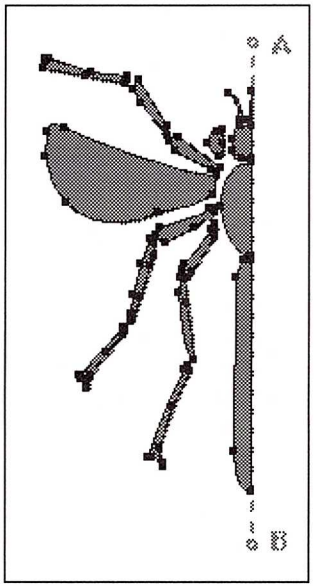
1. Open the file named *Dragonfly Art*.

   The dragonfly document contains both a template and the artwork that has been created for one-half of the dragonfly.

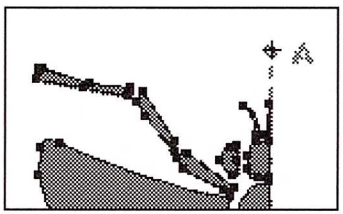


2. Use the selection pointer to select the object.

   When you reflect, you use the mouse to create an imaginary line across which the object is reflected; this line is the axis of reflection.

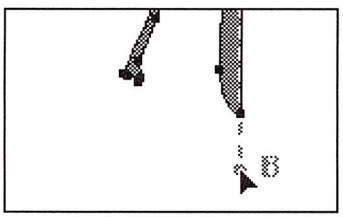


3. Click on the reflect tool. The pointer becomes a dotted cross when you move it to the drawing area.



4. Click on point A at the top of the dragonfly to set the fixed point on the axis of reflection. The pointer becomes an arrowhead.

5. Position the pointer on point B at the bottom of the dragonfly.



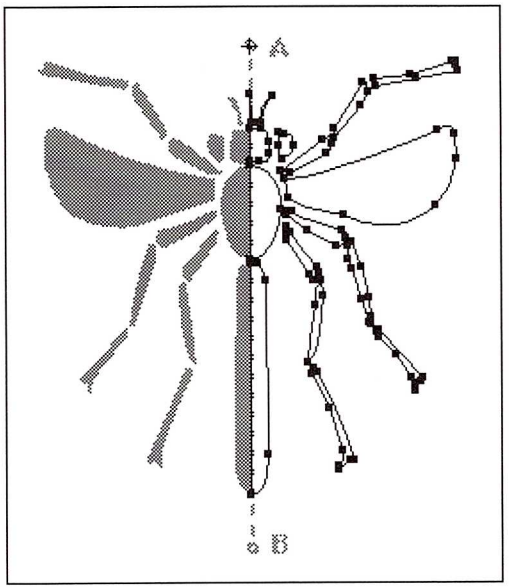
6. Click the mouse button. The object is reflected across the axis.

   When you reflect, you set the axis of rotation by clicking in two locations. Imagine that there is a line between the two places where you click. This is the line across which the object is reflected.

NOTE: You can adjust the axis of reflection by dragging the pointer instead of clicking. The image of the object will be reflected, and you can adjust it accordingly.

You can make a copy of a reflection by holding down the Option key while you are setting the second point.

7. With the object selected and the reflect tool selected, move the pointer to point A.

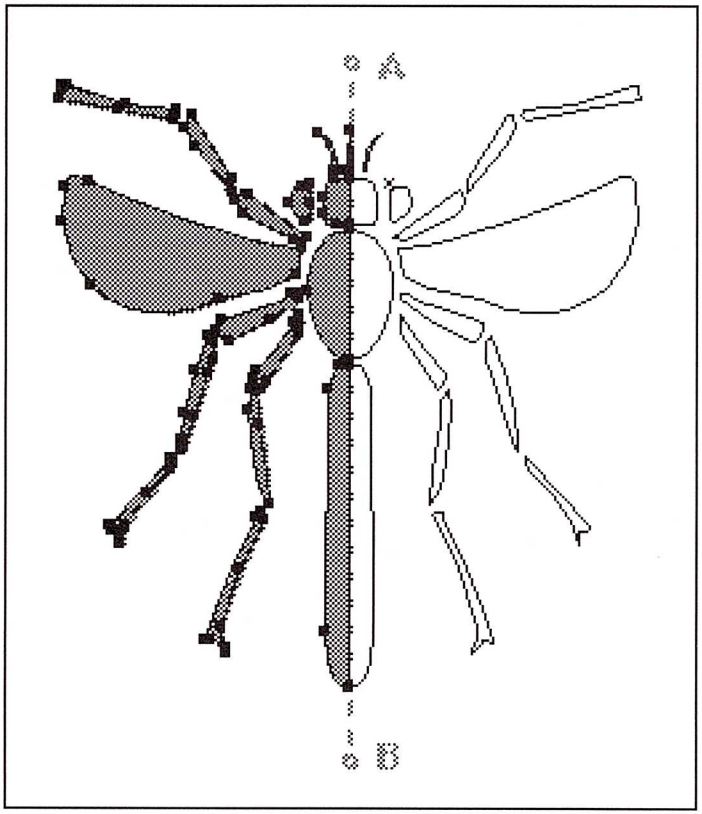


8. Click the mouse button.
9. Move the pointer to point B and hold down the mouse button.
10. Hold down the Option key.

Option

11. If necessary, drag until the object is positioned where you want it.

12. Release the mouse button, and then release the Option key. The object is copied and reflected.



NOTE: You can force the program to use an axis of reflection that is a multiple of 45 degrees, relative to the *x* and *y* axes. After you set the fixed point, hold down the Shift key while you click or drag the arrowhead.

You can also specify an angle of reflection by using the Reflect dialog box. To access this dialog box, hold down the Option key while you are clicking to set the axis of reflection. Specify the horizontal or vertical axis, or enter a value in degrees for an angled axis.

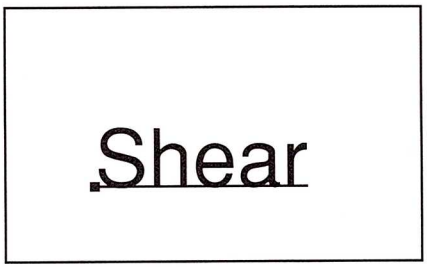
13. Close the document.

Shearing

The shear tool lets you slant or skew an object along a specified axis. This tool is useful for creating a shadow effect. Usually, objects are sheared either horizontally or vertically, although you can shear in both directions. Before you shear an object, you use the pointer to set an imaginary line called the *shear axis*.

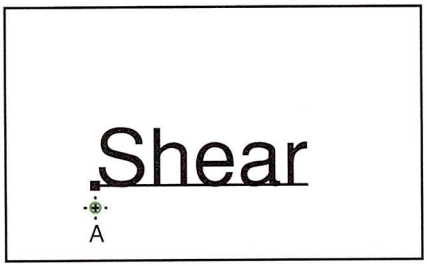
In this example, you will shear some type.

1. Open a new document with no template.
2. Use the type tool to enter the word "Shear" in 30-point Helvetica.



3. Click on the shear tool.

4. Position the pointer near the bottom left of the type, near position A in the figure. The pointer becomes a dotted cross when you move it to the drawing area.



5. Click the mouse button. The pointer becomes an arrowhead.

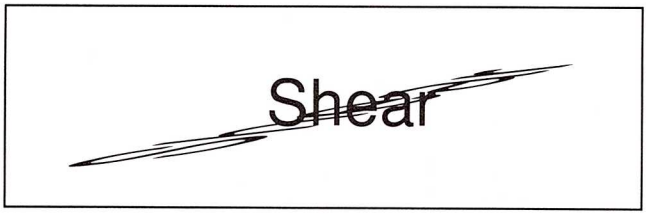
6. Position the pointer to the right of the type, near position B.

NOTE: The farther away from the type you place the pointer, the more control you have over the shear.

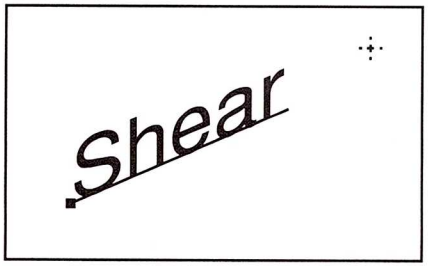
7. Hold down the mouse button and drag upward slowly just a slight amount. As you drag, you can see the sheared image of the type on the screen. Dragging horizontally skews the object along the *x* (horizontal) axis, and dragging vertically skews the object along the *y* (vertical) axis.

Make a mistake?

It is easy to shear objects too much. Move the pointer slowly in small increments so that you can see the effects on your screen as they occur. Holding down the Shift key while you drag also helps control the shear. You can reposition the pointer if you are still holding down the mouse button. If you have released the mouse button, choose Undo from the Edit menu to return to the original object.

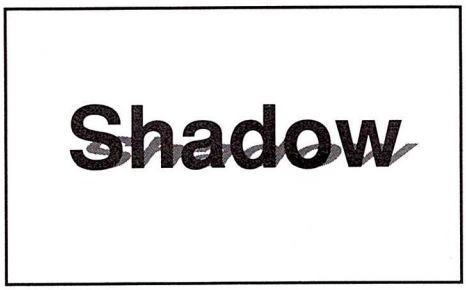


8. When the type is sheared the way you want it, release the mouse button.

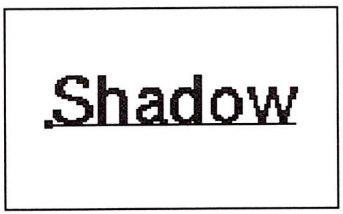


Create shadowed type

In the following example, you will use both the shear and scale tools to create some type with a shadow.



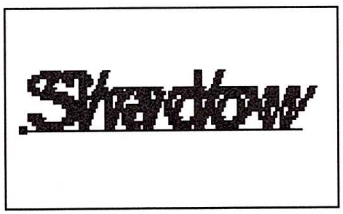
1. Type the word "Shadow" in 36-point Helvetica.



2. Click on the shear tool.

Option

3. Hold down the Option key, and click on the alignment point of the type. The Shear dialog box appears.
4. In the dialog box, click on Horizontal Axis, and type 20 in the Angle field. This will slant the type at a 20-degree angle along the horizontal axis.
5. Click Copy.



You now have two copies of the type. The sheared copy (the last copy created) remains selected.

6. Choose Send To Back from the Edit menu.
7. Click on the selection tool in the toolbox.
8. Click away from the type to deselect everything.

9. Click on the alignment point. This selects the original type.

10. Choose Lock from the Arrange menu.

    The Lock command prevents objects from being selected. When you are working with blocks of type that are directly on top of one another, you can lock one layer while you are working with the other one. When you are ready to work on the locked layer, you can choose Unlock from the Edit menu.

11. Use the selection pointer to select the sheared type.

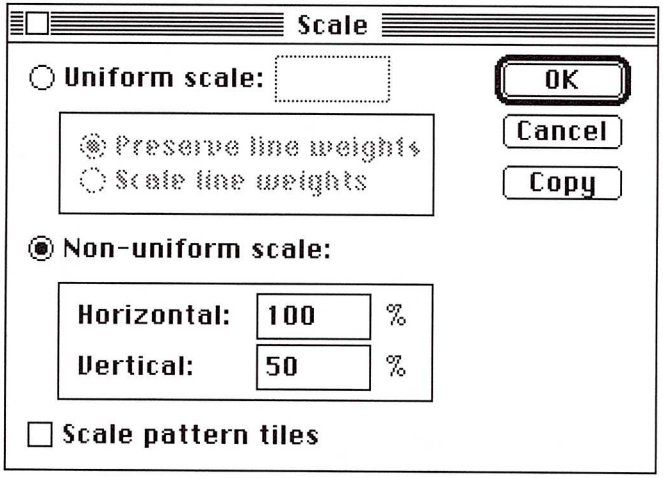
12. Use the Paint dialog box to set the fill options to 50 percent black to produce the shadow effect. Be sure that the stroke options are set to None.

13. Click on the scale tool.

Option

14. Hold down the Option key, and click on the alignment point of the type.

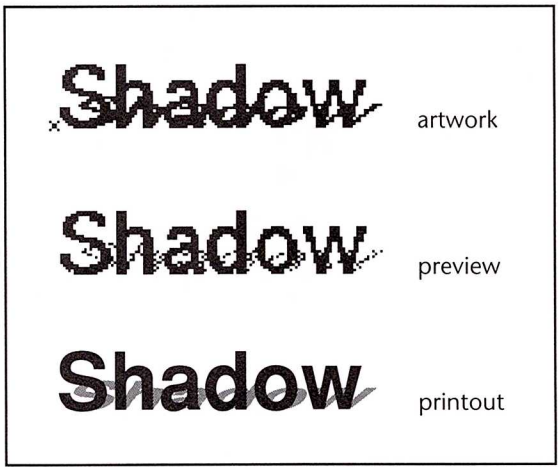
15. In the Scale dialog box, click on Non-Uniform Scale. Set the horizontal scale to 100 percent. Set the vertical scale to 50 percent.



16. Click OK.

17. Choose Preview Illustration from the View menu to see the result.

Print the document if you want to see the results on paper. Remember that the quality of the printed document will be far superior to the image you see on the screen.



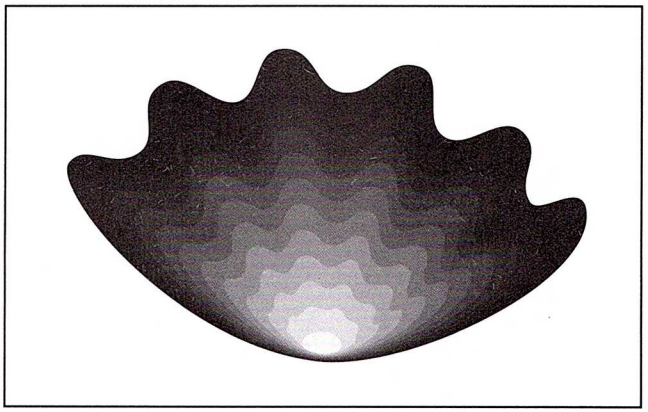
Tips for using the transformation tools

- An object must be selected before it can be transformed.
- Whenever you want to retain the original object as well as create a transformed copy, hold down the Option key before you release the mouse button. If you are using a dialog box, click the Copy option.
- Use the Transform Again command to repeat the last transformation.
- To make transformations with a dialog box, select the tool, and then hold down the Option key while you click.
- Pay attention to the pointer shape. It indicates what you can do next in the transformation process.

With this pointer:	You can:
	Click to set the origin or axis, *or* Hold down the Option key, and click to get a dialog box.
	Click or drag to complete the transformation.
	Click to obtain a dialog box.

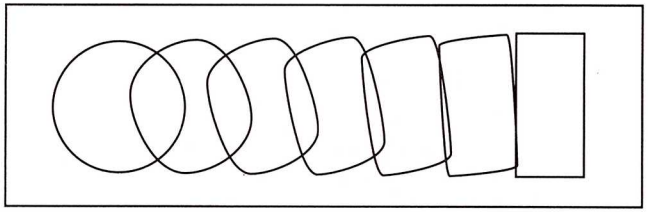
Blending

The blend tool lets you create special effects by blending or creating a series of transformations between two different paths or shades (or colors if you are using color).

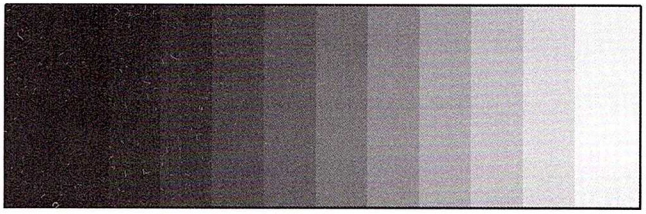


When you use the blend tool, you specify the beginning and the end of the blend, as well as the number of steps you would like there to be between the two. Adobe Illustrator 88 constructs the intermediary steps to perform the blend.

You can blend one shape into another.



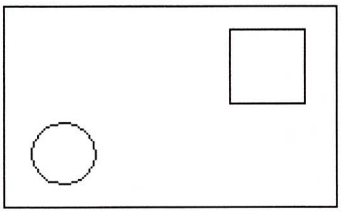
You can also blend shades of gray or different colors.



Blend a circle into a square

1. Clear the screen by pressing ⌘-A, and then pressing the Backspace key.

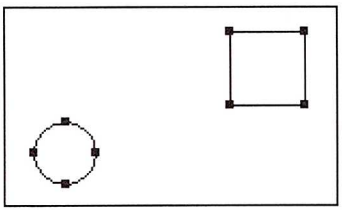

2. Click on the oval tool, and draw a circle. Remember to hold down the Shift key to constrain the oval to a circle.



3. Use no fill, and stroke the circle with a line weight of 1.
4. With the circle selected, choose Ungroup from the Arrange menu.

IMPORTANT: Objects that are part of a blend must always be ungrouped before you can blend them.

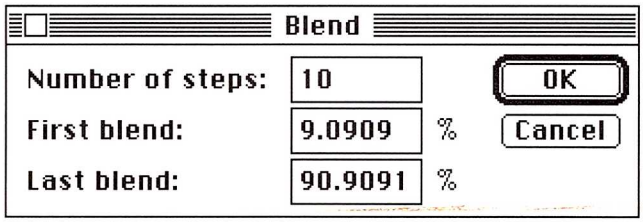

5. Click on the rectangle tool, hold down the Shift key, and draw a square.
6. Use no fill, and stroke the square with a line weight of 1.
7. With the square selected, choose Ungroup from the Arrange menu.
8. Drag the selection marquee (or press ⌘-A) to select both the circle and the square.



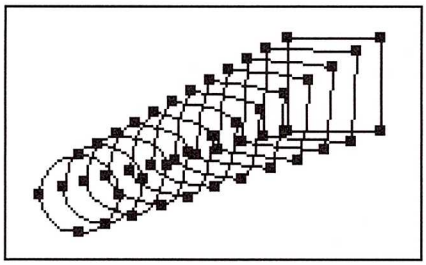
9. Click on the blend tool.
10. Position the pointer over the top anchor point in the circle and click the mouse button. This establishes the initial blend point. When you moved the pointer to the drawing area, it became a dotted cross. After you clicked, the right leg of the cross became longer.

11. Move the pointer to the top left anchor point in the square, and click the mouse button. This establishes the final blend point, and the Blend dialog box appears.

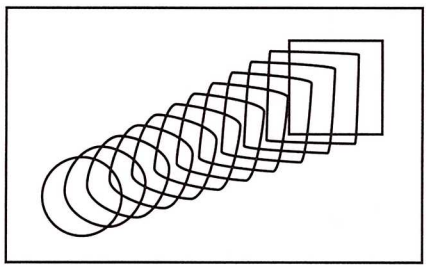
12. Type 10 in the Number Of Steps field. Click OK.



The Adobe Illustrator 88 program constructs the intermediate shapes by creating a line of anchor points between the initial and final blend points. The anchor points between the two objects are connected in a clockwise fashion moving around each object in turn. All anchor points of the intermediate shapes remain selected when the operation is completed.



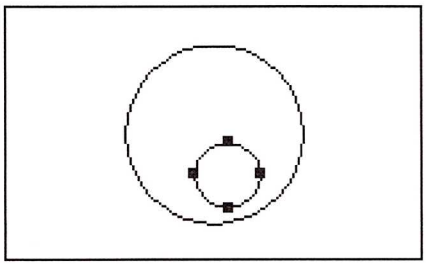
13. Choose Preview Illustration from the View menu to see the results.



Blend from one shade to another

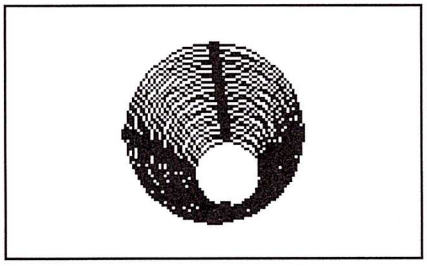
You can also blend shades of gray with the blend tool.

1. Choose Artwork Only from the View menu.
2. Using the oval tool, draw a large circle.
3. Paint the circle with a 100 percent black fill and no stroke.
4. Ungroup the circle.
5. Draw a small circle inside the larger one.

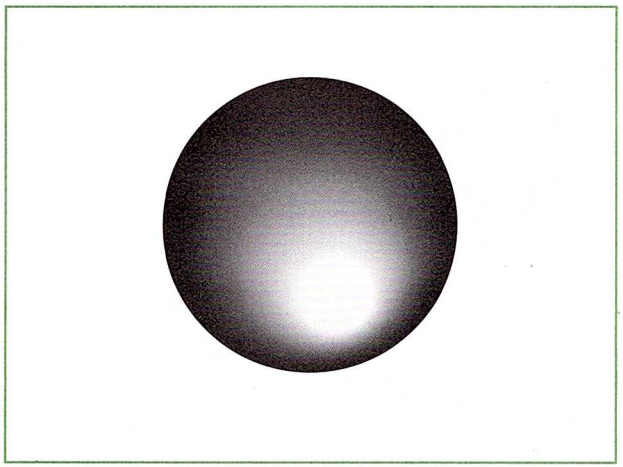


6. Paint the smaller circle with 10 percent black fill and no stroke.
7. Ungroup the smaller circle.
8. Use the selection pointer to select both circles.
9. Click on the blend tool.
10. Click on the top anchor point of the smaller circle to set the initial blend point.
11. Click on the top anchor point of the larger circle to set the final blend point.

    Type 20 in the Number Of Steps field in the Blend dialog box. Click OK.



12. Choose Preview Illustration from the View menu to see the result.



Tips for using the blend tool

- Objects must be ungrouped before you can blend them.
- The intermediate paths created by the blend tool are grouped; the original objects are not grouped with the transformed objects.

What's next?

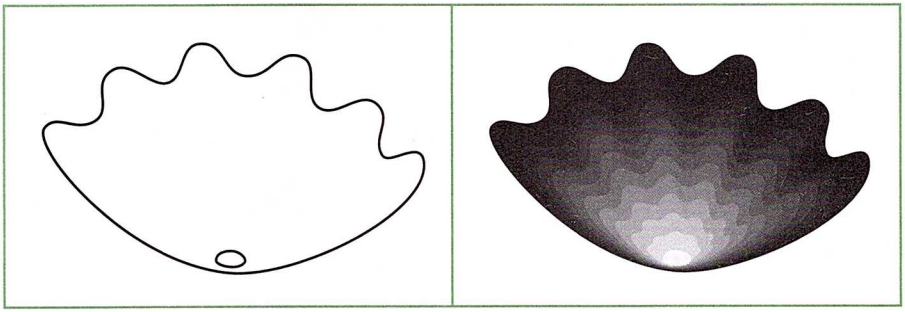
The "Try It Out" section that follows provides examples of effects you can create using the transformation tools.

Now that you know how to create paths and transform them, you are ready to learn some advanced features of the Adobe Illustrator 88 program. In the next lesson, you will learn how to use the mask feature to view only a portion of your drawing.

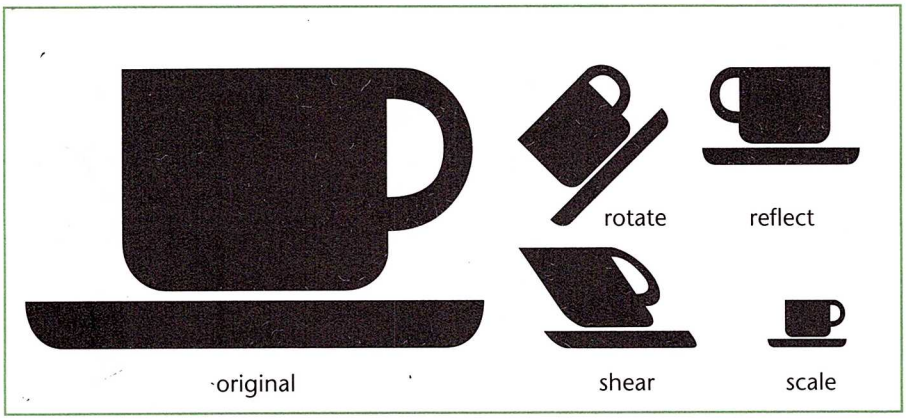
Try it out!

- Create a blended seashell.

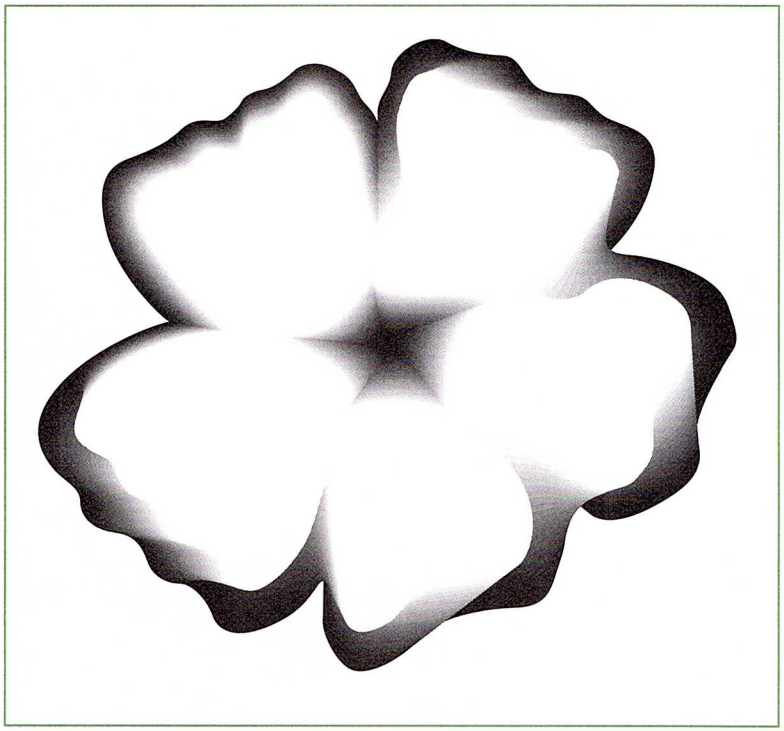
  Create the larger shape with the pen or the freehand tool, and fill it with 100 percent black. Create the smaller shape, and fill it with 10 percent black. (Ungroup any grouped shapes.) Try different numbers of steps in the Blend dialog box to see different shading effects.



- Draw a path and use different transformation tools on it. Remember to select the object before you use the tools. Try using the dialog boxes to perform the transformations.

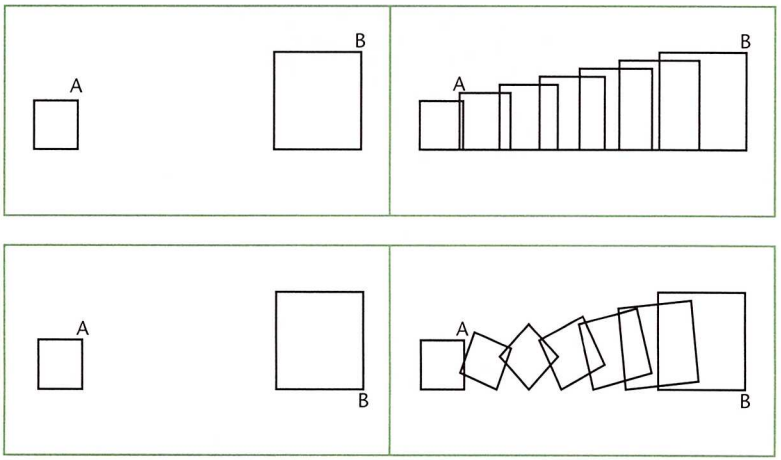


- Try using the blend tool to create interesting edge effects or softened edges.

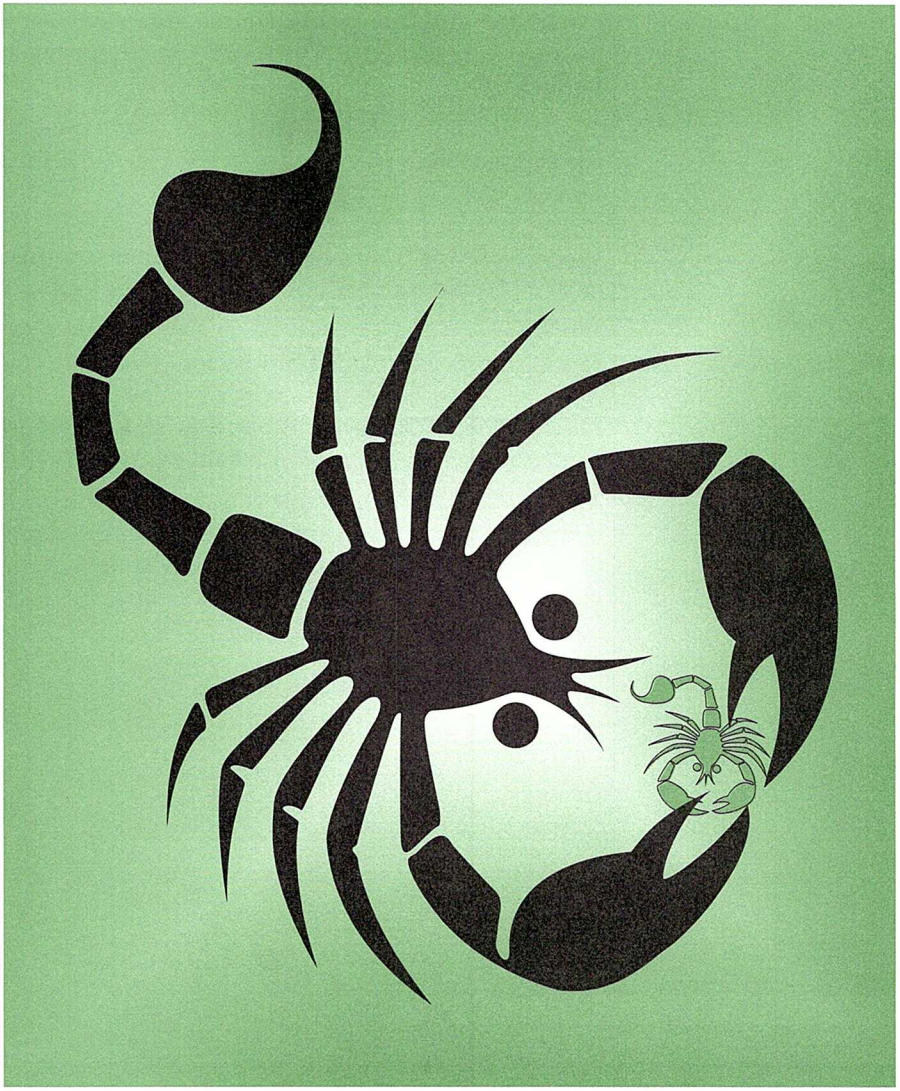


- Try blending objects from different sets of anchor points.

  In both figures, point A is the initial blend point, and point B is the final blend point. Note the difference in the blended transformations when you change the final blend point.



- Try scaling, copying, and rotating objects. Paint the copies with different fills and strokes.



Q: I tried blending a large black circle into a smaller white circle placed inside the larger circle. The result was a large black circle. What happened?

A: The larger black circle is in *front* in the painting order. Use the Send To Back command to place the larger circle in the back. Then repeat the blend process.

Q: When blending from one shade of gray to another, I get lines around each of the intermediate shapes. How can I get a smooth blend of shades?

A: Select None for the Stroke options for each of the objects.

Q: I blended from 100 percent black to white in 40 steps, but when I printed I didn't see 40 different shades. Why?

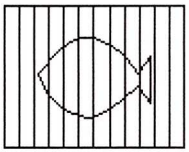
A: The number of shades of gray you see when you print is dependent on your printer. The more dots per inch your printer prints, the more levels of gray you can see. A blend of 26 steps from black to white is about the maximum number of different shades you can see on a 300 dpi printer.

Lesson 9: *Masking*

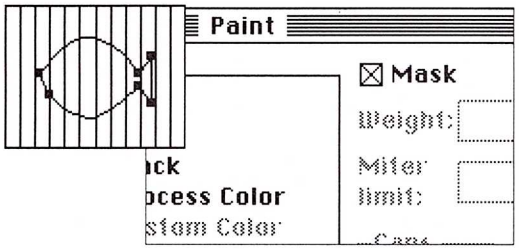
Overview

Masking

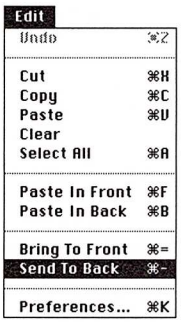
1. Create artwork



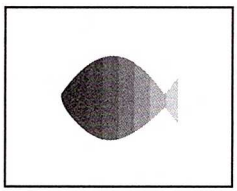
2. Make masking path



3. Send to back



4. Preview



Also in this lesson:

- Hiding

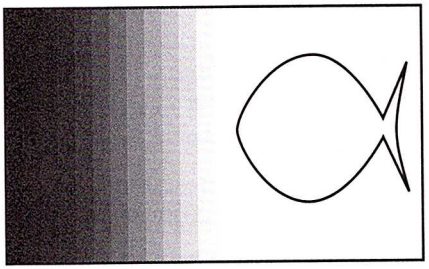
Masking

In this lesson, you will learn how to create a masking path that hides portions of other paths when the artwork is previewed or printed. Read the following section about masking before you do the exercises in the lesson.

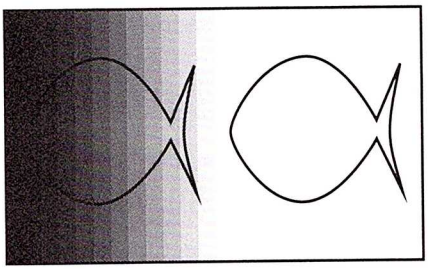
About masking

Sometimes when you create complex drawings, you may want to view only a portion of the entire drawing. You might want to create a shape that is filled with blended shading. You do this by creating a *mask*.

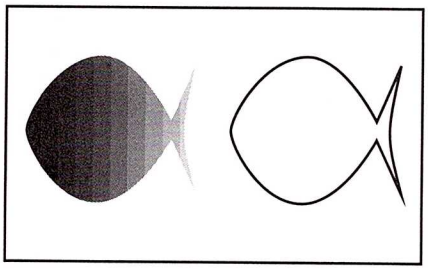
For example, this figure shows a blend and a path outlining a fish shape. The fish shape is not filled.



If you were to copy the fish *behind* the blend in the painting order, the fish would be hidden. If you were to copy the fish in *front* of the blend, the result would look like this.



When you apply the mask attribute to a given path, you create a mask that lets you view the objects inside that path. In this case, the fish on the left masks the blend, so that you see only that portion of the blend inside the fish.

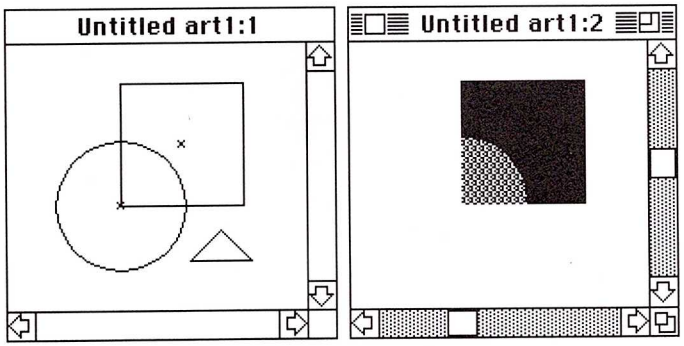


Any path can be designated as a mask. The mask serves to hide any part of an object that falls *outside* its boundary. Masking applies only to objects layered in *front* of the mask; objects behind it are not masked. Imagine that you are looking out at the drawing from behind the backmost layer. The mask is similar to a cut-out stencil; you see only what is visible through the cut-out portion. Everything else is blocked from view.

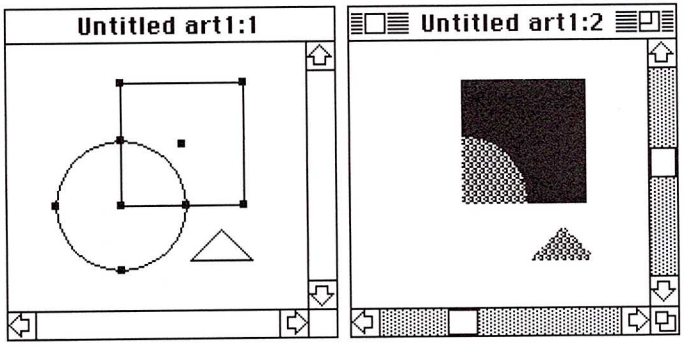
In the previous example, the fish is the mask and is positioned in back of the blend; therefore, you see only that part of the shading that lies within the fish. Understanding the painting order is crucial when you apply a mask to a path. The mask has no effect on objects that are behind it in the painting order. Any portion of an object that is outside the masking path *and* on a layer in front of the path will not be visible when previewed.

You can limit the objects that the masking path affects by *grouping* them with the masking path. When a masking path is grouped with other paths, the mask applies *only* to those objects with which it is grouped. Everything else in the drawing remains visible.

In this figure, the black square is designated as the mask, and it is the backmost layer of the drawing. Everything outside the square is not visible when previewed; you don't see the triangle nor the portion of the circle that lies outside the square.



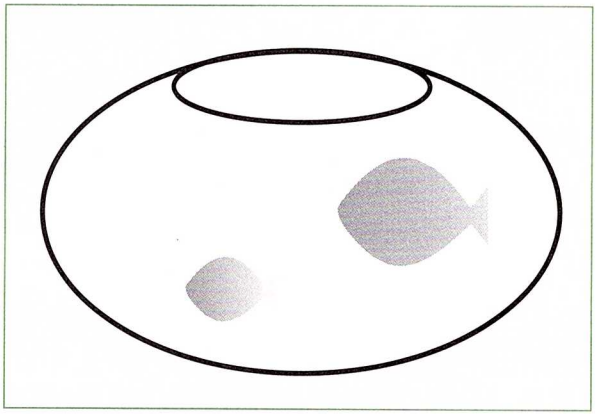
When a masking path is grouped with other objects, only the objects that are grouped together with the masking path are affected by the mask. In the following illustration, the square is designated as the mask, but it is grouped with the circle. Since the mask applies only to the circle, the triangle is visible when previewed.



As you can see, a masking path hides portions of your drawing. To avoid hiding objects you want to see, it is important to group the mask with the objects you want masked. If the masking path is not grouped, it may hide portions of your drawing that you want to see. This is particularly important when you use more than one mask in a drawing.

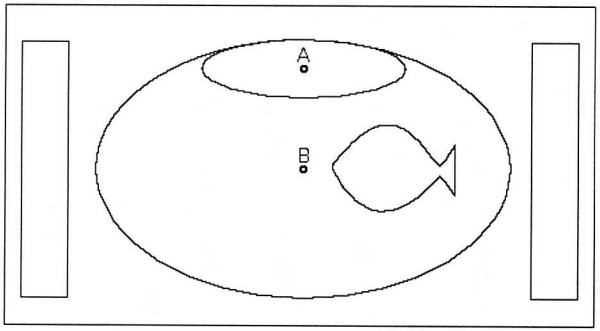
Make a mask

In the following example, you will create two masking paths as a part of the drawing.



Begin by starting the program and opening a template.

1. Start the program, and choose New from the File menu.
2. Find the template named *Fishbowl Template*, and click to open it.



First, you draw and paint the rectangles to use for the blend.

Create the rectangles

1. Click on the rectangle tool.
2. Draw the rectangle on the left of the template.
3. Use the Paint dialog box to paint the rectangle with a fill of 100 percent black and no stroke.
4. With the rectangle selected, choose Ungroup from the Arrange menu.

5. Click on the selection tool.

6. Drag the marquee to select the rectangle, if it is not already selected.

7. Hold down the mouse button, and begin dragging the rectangle to the right.

Shift Option

8. After you begin dragging, hold down the Shift and Option keys. Drag until the rectangle is positioned over the rectangle on the right of the template.

9. Release the mouse button; then release the keys.

10. Use the Paint dialog box to paint the rectangle with a white fill and no stroke.

Blend the rectangles

1. Use the selection marquee to select all points on both rectangles.

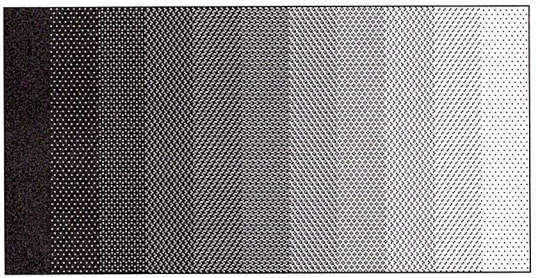
2. Click on the blend tool.

3. Click on the anchor point at the top left corner of the left rectangle.

4. Click on the anchor point at the top left corner of the right rectangle.

5. In the Blend dialog box, type 10 after Number Of Steps. Click OK.

6. Choose Preview Illustration to see the drawing. It should look like this figure.



7. Choose Artwork & Template from the View menu.

   When you work with complex drawings, you will sometimes want to hide portions of the artwork so that you can easily view the object you are drawing. You can temporarily remove the blend from the drawing area with the Hide command. You first group the blend and original rectangles.

8. Using the selection pointer, drag the marquee to select the entire object, including the beginning and ending rectangles and the intermediate steps between them. Since the original objects are not part of the blend, you group them to make the entire object a single unit.

9. Choose Group from the Arrange menu.

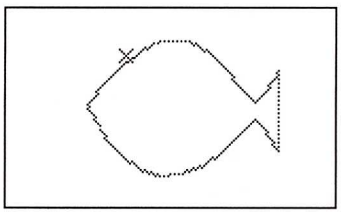
10. With the blend selected, choose Hide from the Arrange menu. The blend is still a part of the drawing but will remain hidden from view until you choose to view it.

    Next, you draw the fish. Although you can draw the fish with the pen or the freehand tool, you will use the auto trace tool for this example.

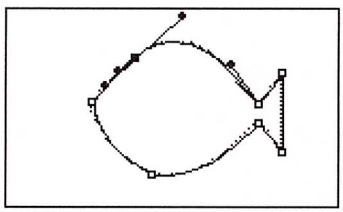
Create the fish

1. Click on the auto trace tool in the toolbox.

2. Position the pointer within 6 pixels of the top of the fish on the template. The pointer becomes an x.



3. Click the mouse button.



A path is automatically created around the fish. You will learn more about the kinds of paths that you can create with the auto trace tool in the next lesson.

Make the object a masking path

1. Click on the selection tool.

Option

2. Hold down the Option key and click on the path of the fish to select the entire path.

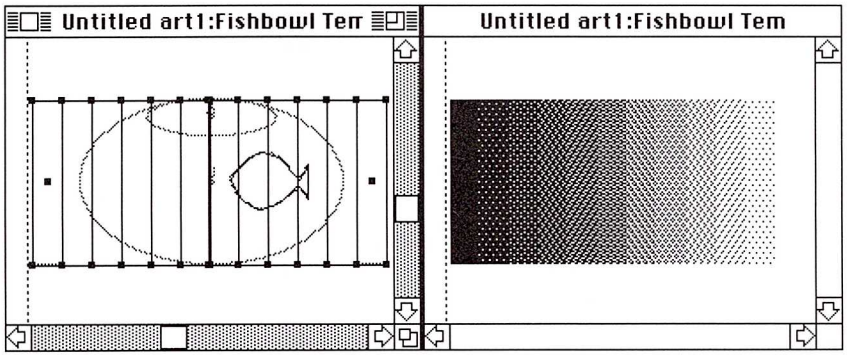
3. Choose Paint from the Style menu.

4. Set the Fill options to None and the Stroke options to None.

5. Click in the Mask checkbox. An x appears in the box to indicate that the selected path will be a masking path. Click OK.

6. Choose Show All from the Arrange menu to view the blend. The blend returns to view.

7. Choose Preview Illustration from the View menu. The preview still shows only the blend, because it is painted *behind* the masking path. You do not see the fish, because it is neither filled nor stroked. This figure shows both the artwork and the preview.



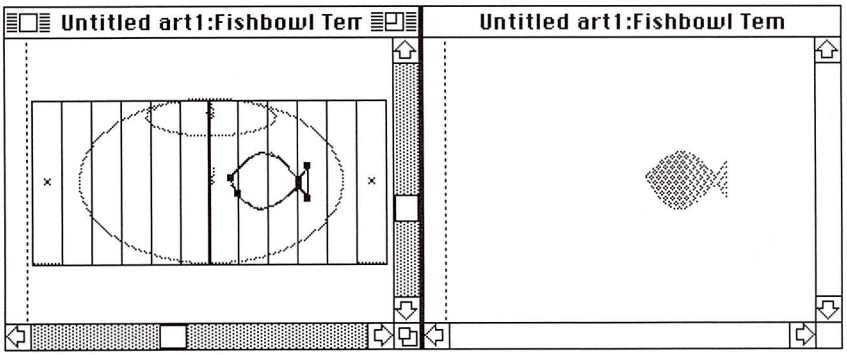
8. Choose Artwork & Template from the View menu.

Option

9. Hold down the Option key, and click on the fish to select the entire path.

10. Choose Send To Back from the Edit menu.

11. Choose Preview Illustration from the View menu. Although the artwork looks the same as it did before, the preview shows the blended fish, as you can see here. The fish is designated as a masking path and is *now behind* the blend. Everything is masked except the shading inside the masking path.



12. Choose Artwork & Template from the View menu.

Create the fish bowl

1. Click on the oval tool.

2. Position the pointer near the top of the template on point A.

Option

3. Hold down the Option key, and drag to create an oval for the top of the fishbowl.

4. Position the pointer over point B.

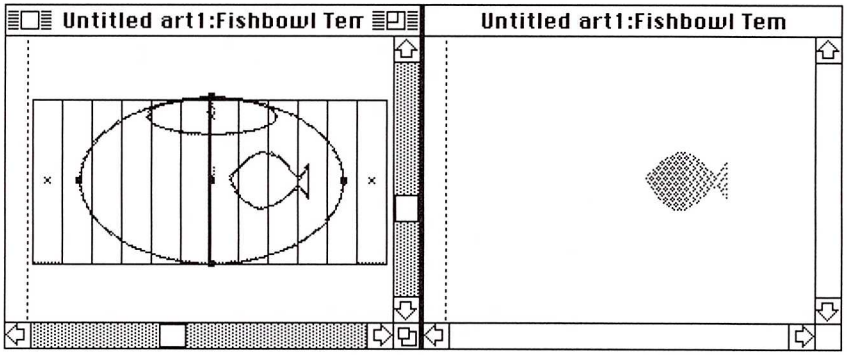
Option

5. Hold down the Option key, and drag to create the oval for the fishbowl.

6. Use the selection pointer, hold down the Shift key, and click on both ovals to select them.

7. Use the Paint dialog box to set the Fill options to None and the Stroke options to 100 percent black. Set the line weight to 3. Click OK.

8. Choose Preview Illustration from the View menu. As you can see in the preview, the fishbowl is not visible because it is currently outside and in front of an ungrouped masking path (the fish).



Group the masking path with the masked object

1. Choose Artwork & Template from the View menu.

Option

2. Hold down the Option key.

3. Use the selection pointer, and click to select the entire path of the fish.

Shift

4. Hold down the Shift key and select the blend. Everything should be selected except the fishbowl.

5. Choose Group from the Arrange menu.

6. Choose Preview Illustration from the View menu. You see the shaded fish inside the fishbowl, because the mask no longer hides the bowl.
7. Choose Artwork & Template from the View menu.

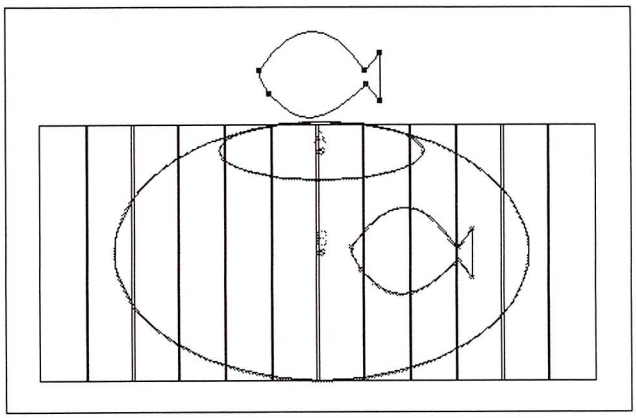
   Next, you will create a smaller shaded fish.

Make a copy of the fish

1. Use the selection tool to select the grouped blend and the fish, if they are not already selected.
2. Choose Ungroup from the Arrange menu. Now that the fish is no longer grouped, you can make a copy of it.
3. Click away from the artwork to deselect everything.

4. Hold down the Option key, and click with the selection pointer to select all the points on the fish.

5. Hold down the Option key, and drag until a copy of the fish is outside of the blend area. The window will automatically scroll, if necessary. The copy of the fish has the same attributes as the original object; it has no fill, no stroke, and is designated as a masking path. Release the mouse button *before* you release the Option key.



6. Use the selection pointer and the Shift key to select the blend and the original fish.
7. Choose Group from the Arrange menu to regroup the fish and the blend.
8. Choose Hide from the Arrange menu to hide the original artwork.

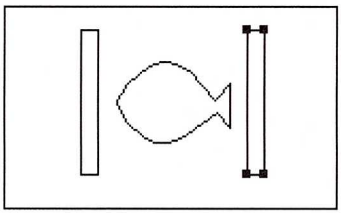
Create a new blend

You will create a blend for the second fish by using the procedure you used previously.

1. Draw a rectangle to the left of the copied fish.
2. Paint the rectangle with a 50 percent black fill and no stroke.
3. Ungroup the rectangle.

Shift *Option*

4. Use the Shift and Option keys to drag a copy of the rectangle to the right of the fish.
5. Paint the second rectangle with a white fill and no stroke.



6. Use Shift-Option-click with the selection pointer to select all points on both rectangles.

7. Click on the blend tool.
8. Click on the top left anchor point of the first rectangle; then click on the top left anchor point of the second rectangle.
9. Enter 10 after Number Of Steps in the Blend dialog box. Click OK.
10. Using the selection pointer, drag the marquee to select all of the blend, the outside rectangles, and the fish.
11. Choose Group from the Arrange menu.

Scale and reposition the object

1. Click on the scale tool.

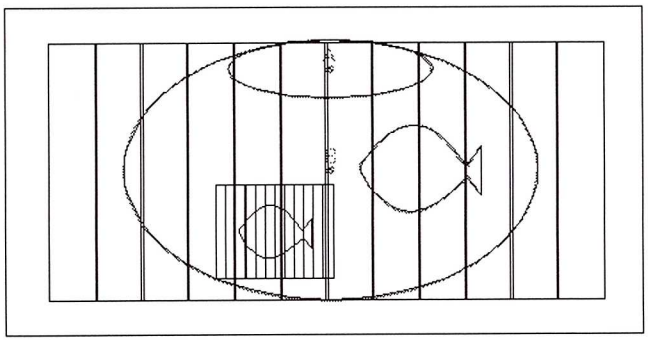
2. Position the pointer in the center of the fish.

3. Hold down the Option key, and click the mouse button.

4. The Scale dialog box appears. Enter 60 for the Uniform Scale value, and then click OK. The entire grouped object is reduced to 60 percent of its original size.

5. Choose Show All from the Arrange menu.

6. Select the second blend and fish and drag it into position inside the bowl.



7. Choose Preview Illustration from the View menu.

   This completes the drawing. Save or print it if you wish.

What's next?

Lessons 1 through 9 have covered the basics of creating and adjusting paths using the Adobe Illustrator 88 program. Lesson 10 explains how to use the auto trace tool to create paths with certain kinds of templates.

Try it out!

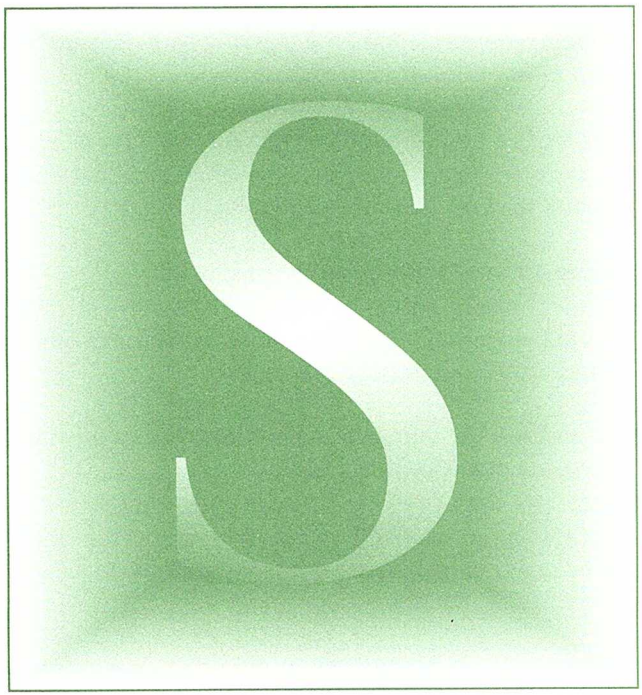
- Try adding more fish to the fishbowl.
- Use the Scale dialog box to make smaller copies of the grouped fish and blend.
- Use the rotate tool to reposition the fish.
- Try changing the number of steps when you blend. Use 20 or 30 steps and compare the results.
- Try creating a masking path over some text.

Follow these steps to create this effect.

1. Use the *California Template* to trace the outline of California.
2. Make a copy of the outline and drag it up and to the right to offset it from the original.
3. Paint the original version with a fill of 50 percent black.

4. Paint the copy with a white fill and no stroke. Click in the Mask checkbox to make the path a masking path.
5. Type "California" several times in the Type dialog box to create a single line of type. Close the dialog box, and copy the line by dragging while you hold down the Option key. Use the Transform Again command to make more copies of the type.
6. Preview the illustration. If the type is not masked properly, try grouping the type together with the masking path.

- Try using type as a masking path.



NOTE: It is recommended that you use only a single letter of type as a masking path, especially if you are using large type sizes.

Q&A

Q: Some objects are not visible in my artwork window. How do I view them?

A: Use the Show All command to see all of your artwork.

Q: Some objects in my artwork window do not show up when I preview. How do I view them?

A: Invisible objects may be hidden by a masking path. Any object that lies outside of and in front of an ungrouped masking path will be hidden. Group the masking path with the object you want masked, or send the hidden objects behind the masking path. Be sure that the invisible objects are either filled or stroked.

Q: How can I tell if an object is a masking path?

A: Select the object and open the Paint dialog box. If the object is a masking path, there will be an x in the Mask checkbox.

Q: Can an open path be a masking path?

A: Yes. The open path is treated as if it were filled; that is, an imaginary line is drawn between the two endpoints. The area of the imaginary fill is the area that shows through the mask.

Q: Can I use the Paint dialog box to stroke a masking path so that an outline of the path is visible?

A: No. The stroke will not show on a masking path except in areas where no other objects overlap it. If you want an outline of the mask, make a copy of the masking path, place it directly behind the mask, and stroke it. Be sure to turn off the Mask option in the copy.

Q: I created a masking path in my artwork window, and I don't see that path when I preview. Why not?

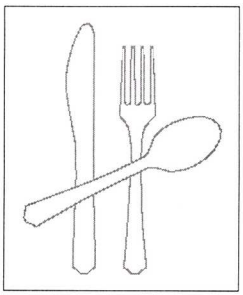
A: If you used no fill and no stroke, the path will be invisible when previewed if there are no objects inside and in front of it.

Lesson 10: *Creating Paths with the Auto Trace Tool*

Overview

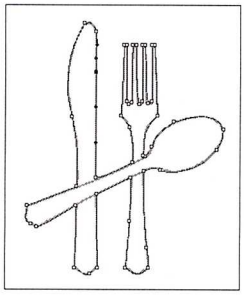
Creating Paths with the Auto Trace Tool

1. Open Template

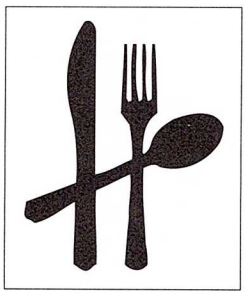


2. Select 

3. Click



4. Preview



Also in this lesson:

- Tracing part of a shape

Creating Paths with the Auto Trace Tool

The auto trace tool allows you to automatically create paths that match shapes on a template. In this lesson, you will practice creating paths with the auto trace tool.

IMPORTANT: If you are using a Macintosh that has only 1 megabyte of memory, you should turn off the RAM cache before you do this lesson. Turning off the RAM cache increases the amount of memory available to the Adobe Illustrator 88 program. To turn off the RAM cache, choose Control Panel from the Apple menu, click the Off button in the RAM Cache field, close the window, and restart your Macintosh.

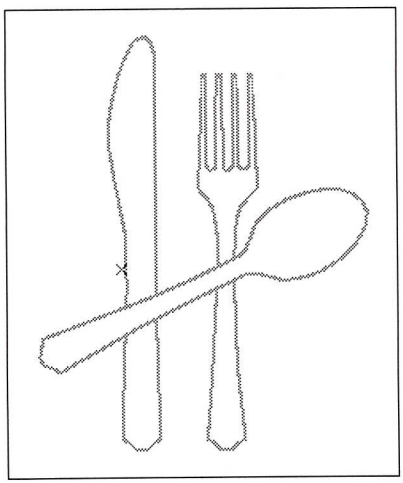
1. Start the program if you have not done so.
2. Choose New from the File menu.
3. Locate the template named *Auto Trace Template*, and open it.

Trace around a shape

1. Use the hand tool to scroll until the silverware is on your screen.

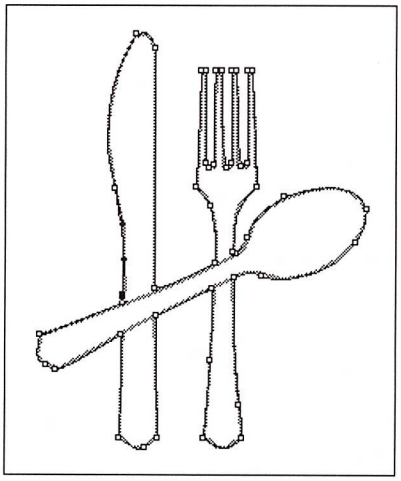
2. Click on the auto trace tool in the toolbox.

3. Move the pointer to the drawing area. The pointer becomes an x.
4. Position the pointer on the outside of the knife blade.



NOTE: The pointer must be within 6 pixels of the shape you intend to trace.

5. Click the mouse button.
   A closed path is created around the outside of the entire shape.

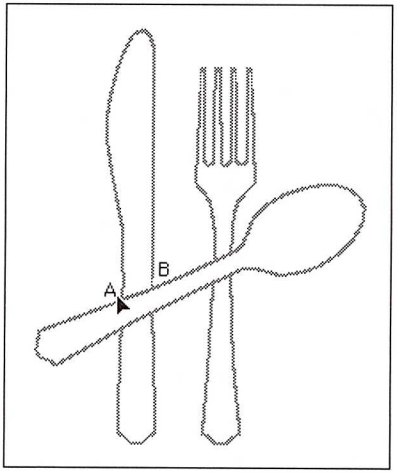


You can also use the auto trace tool to trace only part of a shape on a template.

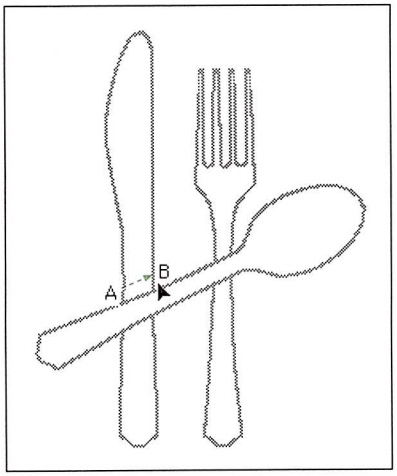
Trace part of a shape

1. Choose Select All from the Edit menu, and then press the Backspace key to delete the path that you just created.

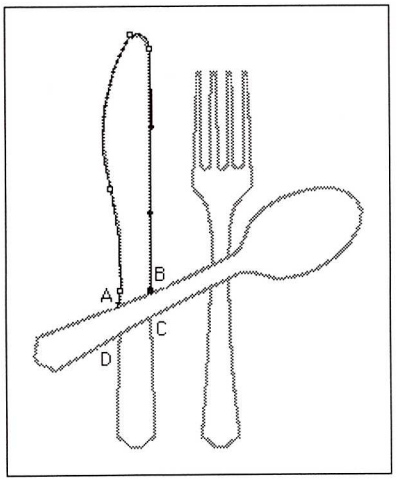
2. With the auto trace tool selected, position the pointer on the outside edge of the knife, just above where it intersects the spoon (near point A), and hold down the mouse button. The pointer changes to an arrowhead.



3. With the mouse button held down, drag the pointer to the right until it is positioned on the outside of the right edge of the knife (near point B).

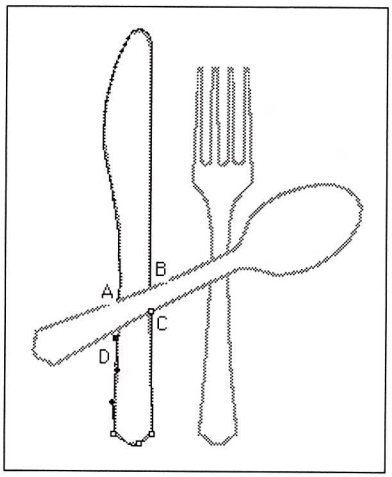


4. Release the mouse button. An open path is created between the point where you first pressed the mouse button and the point where you released it.



Next, you will draw the bottom part of the knife.

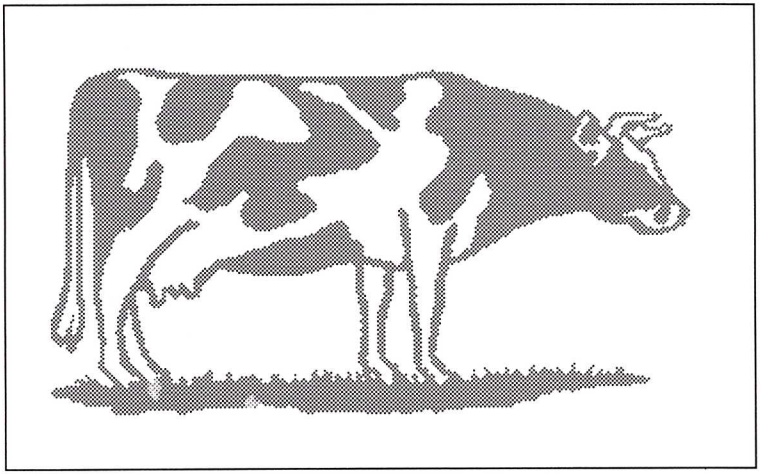
5. Position the pointer on the right side of the knife, just below the point where it intersects the spoon (near point C).
6. Hold down the mouse button.
7. Drag the pointer to the opposite side of the knife, just outside the edge (near point D), and then release the mouse button. An open path is created between the two points.



NOTE: When the auto trace tool creates an open path between two points, the path is created so that the shaded area of the template is to the right of the path. When you create an open path on the *outside* of a shape, the path proceeds clockwise around the shape from the first point to the second. If you are drawing the *inside* of a shape, the path will proceed counterclockwise.

Trace and paint a shape

1. Use the hand tool to scroll until the cow is on your screen.



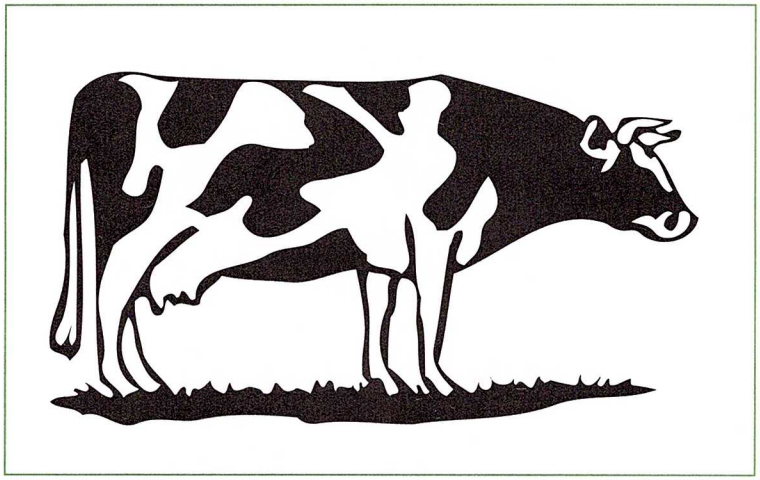
2. Click on the auto trace tool.

3. Position the pointer near the top edge of the cow's back.
4. Click the mouse button.

   A path is created around the cow.

5. Choose Paint from the Style menu, and fill the path with 100 percent black with no stroke.
6. Position the pointer on the edge of the large white area on the side of the cow, and click the mouse buttton.
7. A path is created around the white area.
8. Choose Paint from the Style menu, and set the fill to White and the stroke to None.
9. Continue to click on the edges of the white areas inside the cow. Remember to create a path for the area between the legs.

10. Preview the drawing to see the results.

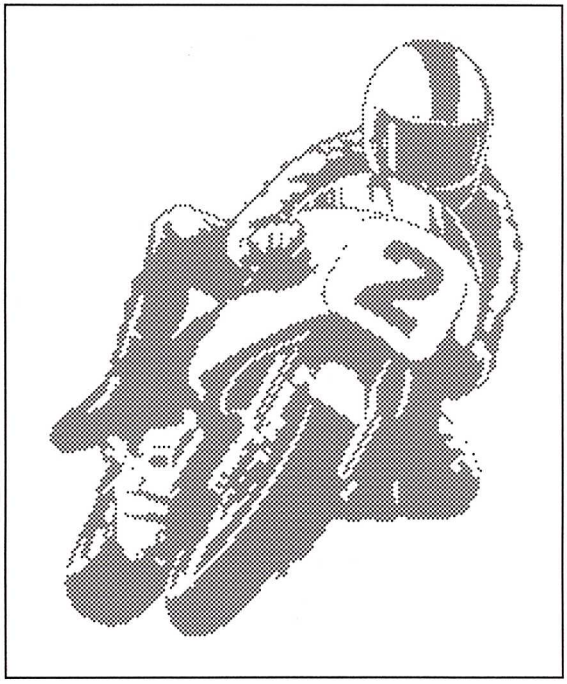


Tips for using the auto trace tool

- Be careful with overlapping shapes. Remember that the auto trace tool will follow the outline of any shaded area.
- Keep the painting order in mind. Begin with background shapes first, and work forward.
- Fine-tune your template before you begin. Use a paint program to remove unwanted pixels or fill in missing shading.
- Use the Preferences dialog box to change the auto trace gap distance if the template has missing pixels. When the auto trace gap distance is set to 2, for example, the path will continue *across* an area where 2 pixels are missing, rather than *around* the area.

Try it out!

- Trace a path around the *inside* of the spoon by clicking with the auto trace tool just inside the edge of the spoon on the template.
- Trace the silverware with different settings for the freehand tolerance in the Preferences dialog box. The higher the value, the *smoother* the curves. When you trace objects with sharp corners, you will probably want a lower freehand tolerance.
- Scroll to display the motorcycle on the template. Use the auto trace tool to create the paths. Remember to keep the painting order in mind, so that you do not inadvertently hide layers.



Use the auto trace tool to trace other templates, such as *California Template*, *Scorpion Template*, or *Dragonfly template*.

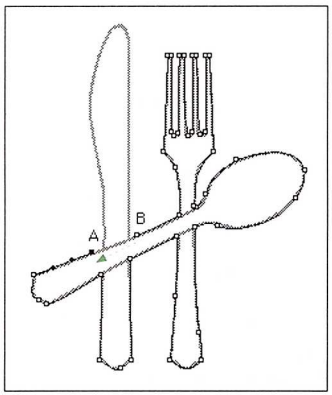
Q&A

Q: I've drawn a path with the auto trace tool, and I am unable to preview or print it. What do I do?

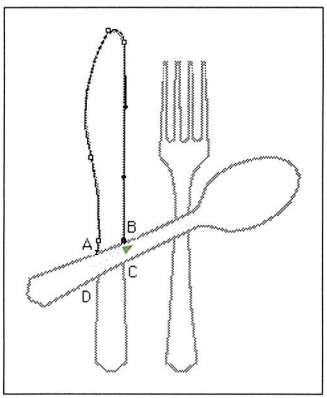
A: You need more RAM. Save the document. Use the Apple Control Panel to turn off the RAM cache.

Q: I wanted to create a path around the top of the knife, but I got a path around the rest of the shape. Why?

A: You held down the mouse button on point B and moved it to point A.



Since the path is created with the shaded area on its right side, that path is drawn around the fork and the spoon.



To trace only the knife blade, press the mouse button at point A and drag it to point B.

Q: An error message says "Out of memory, can't create a path." What can I do?

A: The path must be shorter. Break the path down into a series of shorter paths by dragging to begin and end them.