International Symbols

Biotech Services manages large-scale manufacturing facilities specializing in everything from digital photographic equipment to large earth-moving machines used to build new roads. The company builds plants all over the world that in many cases handle hazardous chemicals and undertake dangerous tasks — which means they must prominently display appropriate warnings. Biotech Services hired you to create a digital collection of universal symbols that they can use to create signs, print on the side of large machines, and place as icons on their Web site.

This project incorporates the following skills:

❏ Placing raster images into an Illustrator file to use as drawing templates

❏ Creating and managing simple shapes and lines

❏ Using various tools and panels to transform objects' color, position, and shape

❏ Cloning objects to minimize repetitive tasks

❏ Using layers to organize and manage complex artwork

❏ Drawing complex shapes by combining simple shapes

We have a set of universal warning symbols on our Web site, but we need to use those same icons in other places as well. Our printer told us that the symbols on our Web site are "low res," so they can't be used for print projects. The printer also said he needs vector graphics that will scale larger and still look good. The printer suggested we hire a designer to create digital versions of the icons so we can use them for a wide variety of purposes, from large machinery signs to small plastic cards to anything else that might come up. We need you to help us figure out exactly what we need and then create the icons for us.

art director comments

Basically, we have the icons, but they're low-resolution raster images, so they only work for the Web, and they can't be enlarged. The good news is that you can use the existing icons as templates and more or less trace them to create the new icons.

The client needs files that can be printed cleanly and scaled from a couple of inches up to several feet. Illustrator vector files are perfect for this type of job. In fact, vector graphics get their resolution from the printer being used for a specific job, so you can scale them to any size you want without losing quality.

project objectives

To complete this project, you will:

- ❏ Create a grid that will eventually hold all icons in one document
- ❏ Control objects' stroke, fill, and transparency attributes
- ❏ Import and use the client's raster images as templates, which you can then trace
- ❏ Use layers to manage complex artwork
- ❏ Use the Line Segment tool to create a complex object from a set of straight lines
- ❏ Lock, unlock, hide, and show objects to navigate the objects' stacking order
- ❏ Rotate and reflect objects to create complex artwork from simple shapes
- ❏ Use the Pathfinder to combine simple shapes into a single complex object

Stage 1 **Setting up the Workspace**

There are two primary types of digital artwork: raster images and vector graphics. (**Line art**, sometimes categorized as a third type of image, is actually a type of raster image.)

Raster images are pixel-based, made up of a grid of individual **pixels** (**rasters** or **bits**) in rows and columns (called a **bitmap**). Raster files are **resolution dependent**; their resolution is determined when you scan, photograph, or create the file. As a professional graphic designer, you should have a basic understanding of the following terms and concepts:

- **Pixels per inch (ppi)** is the number of pixels in one horizontal or vertical inch of a digital raster file.

- **Lines per inch (lpi)** is the number of halftone dots produced in a linear inch by a high-resolution imagesetter, which simulates the appearance of continuous-tone color.

- **Dots per inch (dpi)** or **spots per inch (spi)** is the number of dots produced by an output device in a single line of output.

Drawing objects that you create in Illustrator are **vector graphics**, which are composed of mathematical descriptions of a series of lines and points. Vector graphics are **resolution independent**; they can be freely scaled and are output at the resolution of the output device.

CREATE A NEW DOCUMENT

In this project, you work with the basics of creating vector graphics in Illustrator using a number of different drawing tools, adding color, and managing various aspects of your artwork. The first step is to create a new document for building your artwork.

1. Download **Symbols_AICC15_RF.zip** from the Student Files Web page.

2. **Expand the ZIP archive in your WIP folder (Macintosh) or copy the archive contents into your WIP folder (Windows).**

    This results in a folder named **Symbols**, which contains all of the files you need for this project. You should also use this folder to save the files you create in this project.

3. **In Illustrator, choose File>New.**

4. **In the resulting New Document dialog box, type** icons **in the Name field.**

    The New Document dialog box defaults to the last-used settings.

5. **Choose Print in the New Document Profile menu, and make sure the Number of Artboards field is set to 1.**

    Illustrator includes the ability to create multiple **artboards** (basically, Illustrator's version of "pages"). For this project, however, you need only a single artboard.

6. **Choose Letter in the Size menu, choose Points in the Units menu, and choose the Portrait Orientation option.**

    The **point** is a standard unit of measurement for graphic designers. There are 72 points in an inch. As you complete this project, you will work with other units of measurement; you will convert the units later.

7. **Set all four bleed values to** 0.

    Bleed is the amount an object needs to extend past the edge of the artboard or page to meet the mechanical requirements of commercial printing.

Note:

If necessary, refer to Page 1 of the Interface chapter for specific information on expanding or accessing the required resource files.

Note:

To begin this project, we reset the built-in Essentials workspace. Feel free to work with whatever settings you are most comfortable using.
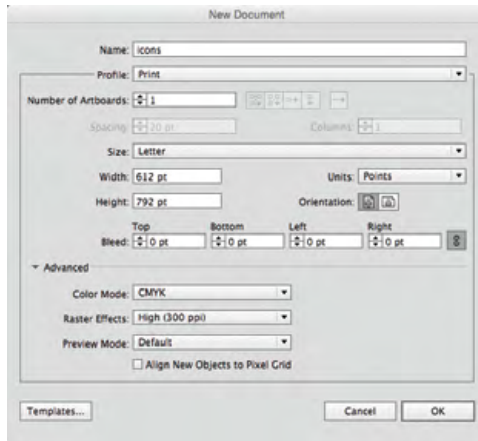
Note:

You learn more about bleeds in Project 3: Identity Package.

8. **If the Advanced options aren't visible, click the arrow button to the left of the word Advanced.**

9. **Make sure the Color Mode is set to CMYK and the Preview Mode is set to Default.**

   CMYK is the standard color mode for printing, and RGB is the standard color mode for digital distribution.

   Don't worry about the other Advanced options for now. You will learn about those in later projects when they are more relevant.

10. **Click OK to create the new file.**

    In the resulting document window, the letter-size "page" (or artboard) is represented by a dark black line. As we explained in the Interface chapter, the panels you see depend on what was done the last time you (or someone else) used the application. Because workspace arrangement is such a personal preference, we tell you what panels you need to use, but we don't tell you where to place them.

    In our screen shots, we typically float panels over the relevant area of the document so we can focus the images on the most important part of the file at any particular point. As you complete the projects in this book, feel free to dock the panels, grouped or ungrouped, iconized or expanded, however you prefer.
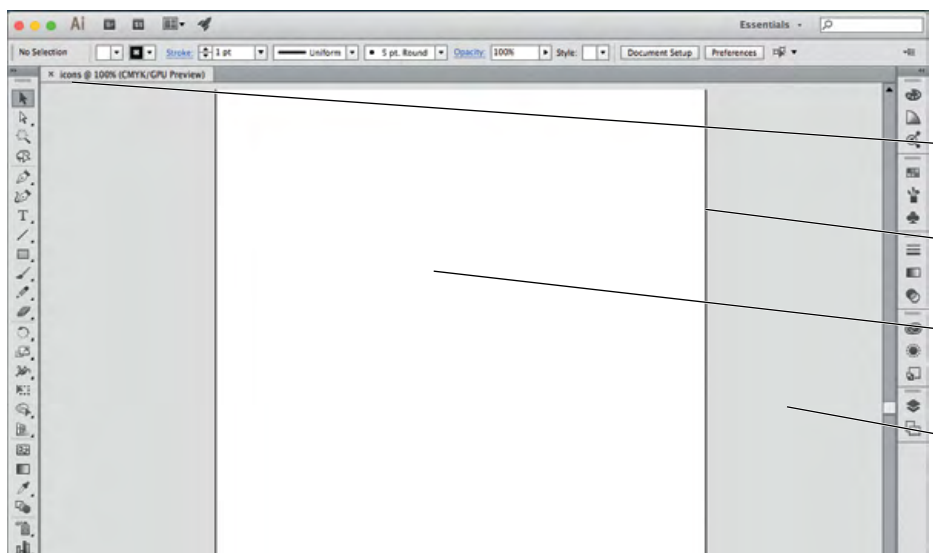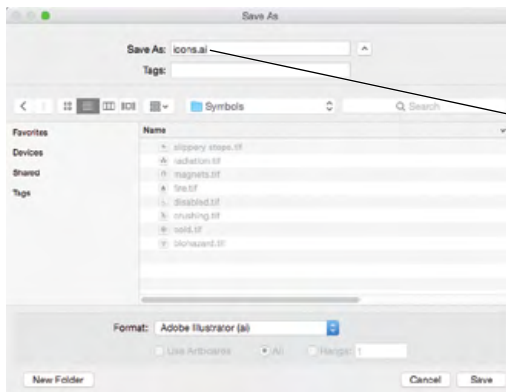
The name you defined appears in the document tab.

This is the artboard edge.

The artboard area is white.

The area outside the artboard is gray.

11. Choose File>Save As and navigate to your WIP>Symbols folder.

If you assign a name in the New Document dialog box (as you did in Step 4), that name becomes the default file name in the Save As dialog box.

The file name defaults to the name you defined when you created the file, including the ".ai" extension.

12. Click Save in the Save As dialog box. Review the options in the resulting Illustrator Options dialog box.

This dialog box determines what is stored in the resulting file. The default options are adequate for most files.

*   Use the **Version** menu to save files to be compatible with earlier versions of the software. (Keep in mind that many features are not supported by earlier versions; if you save a file for an earlier version, some file information will probably be lost.)

*   **Subset Fonts when Percent of Characters Used Is Less Than** determines when to embed an entire font instead of just the characters that are used in the file. Embedding the entire font can significantly increase file size.

*   Make sure **Create PDF Compatible File** is checked if you want to use the file with other Adobe applications (such as placing it into an InDesign layout). This does not create a separate PDF file; it simply includes PDF preview data in the file.

*   **Include Linked Files** embeds files that are linked to the artwork.

*   **Embed ICC Profiles** stores color information inside the file for use in a color-managed workflow.

*   **Use Compression** compresses PDF data in the Illustrator file.

*   **Save Each Artboard to a Separate File** saves each artboard as a separate file; a separate master file with all artboards is also created.

*   **Transparency** options determine what happens to transparent objects when you save a file for Illustrator 9.0 or earlier. Preserve Paths discards transparency effects and resets transparent artwork to 100% opacity and Normal blending mode. Preserve Appearance and Overprints preserves overprints that don't interact with transparent objects; overprints that interact with transparent objects are flattened.
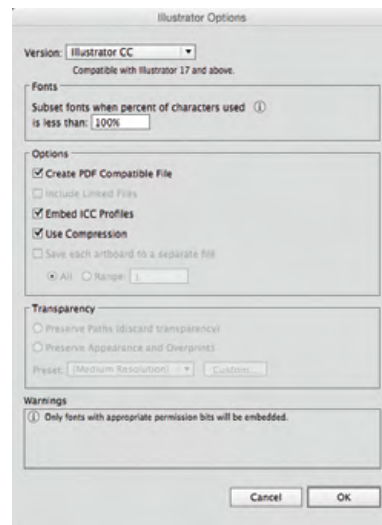
13. Click OK to save the file, and then continue to the next exercise.

DEFINE SMART GUIDE PREFERENCES

Adobe Illustrator provides many tools to help you create precise lines and shapes. **Smart Guides** are temporary snap-to guides that help you create, align, and transform objects. Smart Guides also show you when the cursor is at a precise angle relative to the original position of the object or point you're moving. In this exercise, you will make sure the correct Smart Guides are active.

1. **With `icons.ai` open, click the Preferences button in the Control panel.**

2. **Choose Smart Guides in the list of categories on the left.**

3. **Make sure the Alignment Guides, Object Highlighting, Anchor/Path Labels, and Measurement Labels options are selected and click OK.**
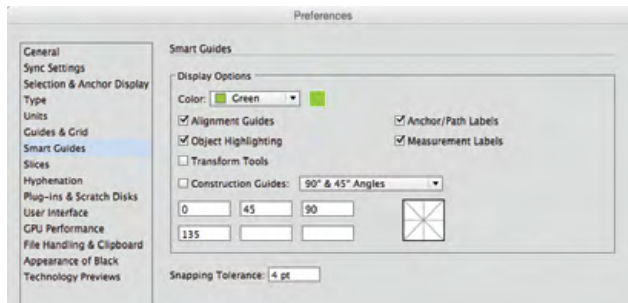
4. **Choose View>Smart Guides to make sure that option is toggled on (checked).**

   If the option is already checked, simply move your mouse away from the menu and click to dismiss the menu without changing the active option.
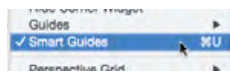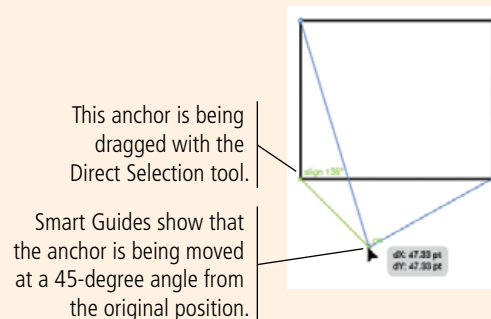

5. **Continue to the next exercise.**

Using Smart Guides

ILLUSTRATOR FOUNDATIONS

You can change the appearance and behavior of Smart Guides in the Preferences dialog box. The Display options determine what is visible when Smart Guides are active:

- When **Alignment Guides** is active, Smart Guides show when a new or moved object aligns to the center or edge of a nearby object.

- When **Object Highlighting** is active, moving the mouse over any part of an unselected object shows the anchors and paths that make up that object.

- When **Transform Tools** is active, Smart Guides display when you scale, rotate, or shear objects.

- When **Anchor/Path Labels** is active, Smart Guides include labels that show the type of element (path or anchor) under the cursor.

- When **Measurement Labels** is active, Smart Guides show the distance and angle of movement.

- When **Construction Guides** is active, Smart Guides appear when you move objects in the file at or near defined angles (0°, 45°, 90°, and 135° are the default angles). A number of common angle options are built into the related menu, or you can type up to six specific angles in the available fields.


This anchor is being dragged with the Direct Selection tool.

Smart Guides show that the anchor is being moved at a 45-degree angle from the original position.

DRAW ROUNDED RECTANGLES

Now that you have a place to draw (the artboard), you're ready to start creating the icon artwork. The first step of this project requires a set of background shapes — simple rectangles with rounded corners — to contain each icon. Illustrator includes a number of shape tools that make it easy to create this kind of basic shape — rectangles (or squares), ellipses (or circles), and so on.
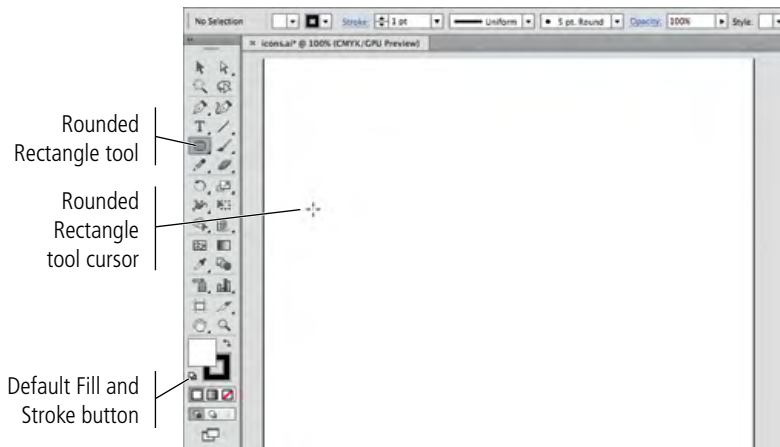
1. **With icons.ai open, click the Rectangle tool in the Tools panel and hold down the mouse button until the nested tools appear. Choose the Rounded Rectangle tool from the list of nested tools.**

   When you choose a nested tool, that variation becomes the default option in the Tools panel. You don't need to access the nested menu to select the Rounded Rectangle tool again as long as the application remains open. (If you quit and relaunch Illustrator, the regular Rectangle tool again becomes the default tool in that position.)
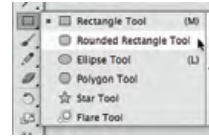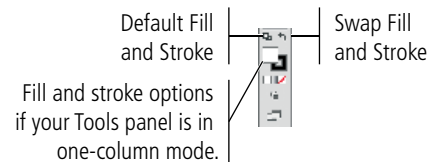
2. **Click the Default Fill and Stroke button at the bottom of the Tools panel.**

   In Illustrator, the default fill is white and the default stroke is 1-pt black.

Rounded Rectangle tool

Rounded Rectangle tool cursor

Default Fill and Stroke button

Default Fill and Stroke

Swap Fill and Stroke

Fill and stroke options if your Tools panel is in one-column mode.

3. **With the Rounded Rectangle tool active, click anywhere on the artboard.**

   The resulting dialog box asks how big you want to make the new rectangle, defaulting to the last-used measurements. The default measurement system is points, as you defined when you created this file.
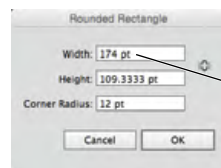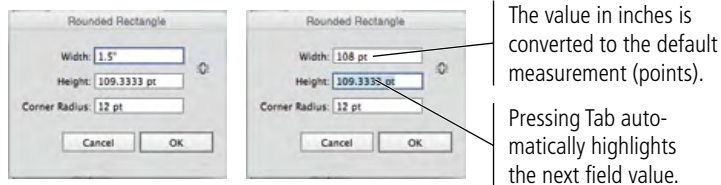

When the dialog box opens, the Width field is automatically highlighted. You can simply type to replace the existing value.

4. **Type 1.5″ in the Width field and then press Tab to move to the Height field.**

Regardless of what unit you see in the dialog box, you can enter values in whatever system you prefer, as long as you remember to type the correct unit in the dialog box fields (use ″ for inches, mm for millimeters, and pt for points; there are a few others, but they are rarely used). Illustrator automatically translates one unit of measurement to another.

When you move to the next field, Illustrator calculates the conversion of 1.5 inches (the value you placed in the Width field) to 108 pt (the value that automatically appears in the Width field after you move to the Height field).


The value in inches is converted to the default measurement (points).

Pressing Tab automatically highlights the next field value.

5. **Type 1.5″ in the Height field.**

Because you are making a shape with the same height and width, you could also click the Constrain icon (the broken chain) on the right side of the dialog box to make the Height field match the modified Width field.

6. **Make sure the corner radius field is set to 12 pt.**

A rounded-corner rectangle is simply a rectangle with the corners cut at a specific distance from the end (the corner radius). The two sides are connected with one-fourth of a circle, which has a radius equal to the amount of the rounding.
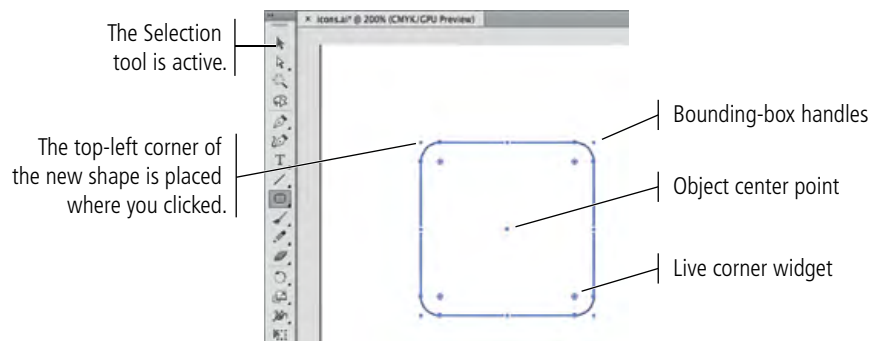

This imaginary circle has a 12-pt radius.
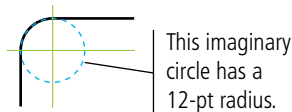
7. **Click OK to create the new shape.**

A shape appears on the artboard with its top-left corner exactly where you clicked with the Rounded Rectangle tool. (If you Option/Alt-click with any of the shape tools, the place where you click becomes the center of the new shape.)

8. **Click the Selection tool in the Tools panel and zoom in to 200%.**

When the object is selected, the rectangular **bounding box** marks the outermost edges of the shape. **Bounding box handles** mark the corners and exact horizontal and vertical center of the shape. (If you don't see the bounding box, choose View>Show Bounding Box.) Because this shape has rounded corners, the corner bounding-box handles actually appear outside the shape edges.

Four small circles inside each corner of the shape are Live Corner widgets, which allow you to click and drag to change the shape of object corners.
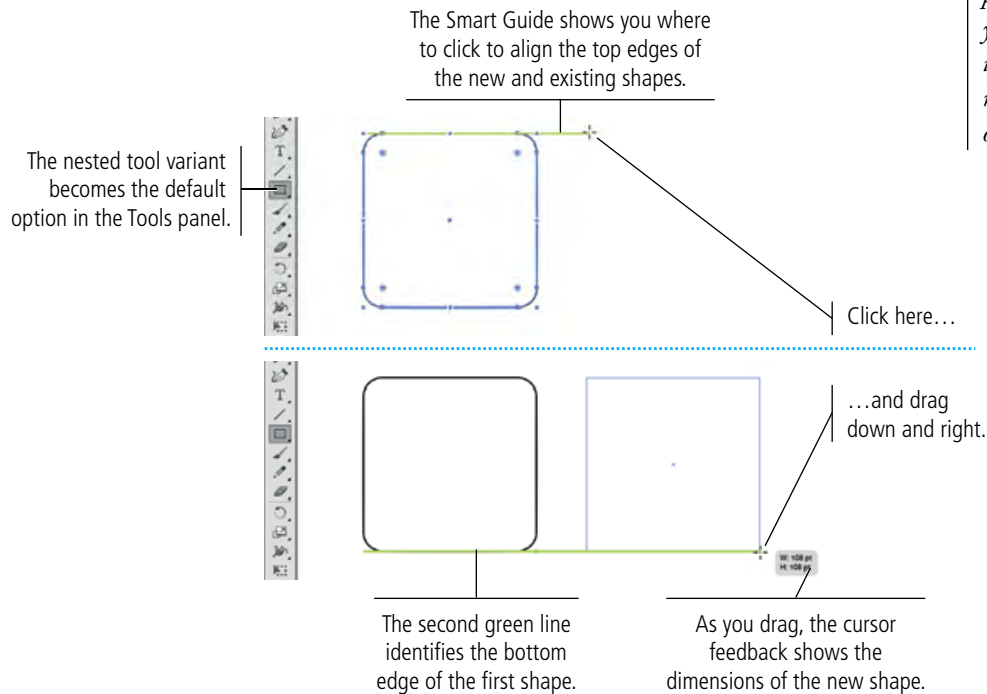

The Selection tool is active.

The top-left corner of the new shape is placed where you clicked.

Bounding-box handles

Object center point

Live corner widget

Note:

As a general rule, we don't tell you what view percentage to use unless we want to highlight a specific issue. As you work through the projects in this book, we encourage you to zoom in and out as necessary to meet your specific needs.

9. **Click the Rounded Rectangle tool in the Tools panel and hold down the mouse button until the nested tools appear. Choose the Rectangle tool from the list of nested tools.**

10. **Move the cursor to the right of the top edge of the existing shape. When you see a green line connected to the top edge of the first shape, click, hold down the mouse button, and drag down and right to begin creating a second shape. Do not release the mouse button.**

The green line is a function of the Smart Guides feature, which provides instant feedback while you draw. As you drag, notice the cursor feedback showing the size of the new shape. Also notice that as you drag near the bottom edge of the first shape, a Smart Guide appears to indicate your position.

The Smart Guide shows you where to click to align the top edges of the new and existing shapes.

The nested tool variant becomes the default option in the Tools panel.

Click here…

…and drag down and right.

The second green line identifies the bottom edge of the first shape.

As you drag, the cursor feedback shows the dimensions of the new shape.

> *Note:*
>
> *Cursor feedback and Smart Guides provide precise control over what you're creating — as individual objects and in relation to other objects on the artboard.*

11. **While still holding down the mouse button, press the Shift key. When the cursor feedback shows both Width and Height values of 108 pt, release the mouse button to create the second shape.**

Pressing Shift **constrains** the shape to equal height and width. Although you can accomplish the same result by carefully monitoring the cursor feedback, pressing the Shift key makes the process faster and easier.

Because you are using the Rectangle tool instead of the Rounded Rectangle tool, the second shape does not have rounded corners; the bounding-box handles match the actual shape corners.

When you release the mouse button, the second shape is created (constrained to equal height and width).

Bounding-box handle and actual shape corner
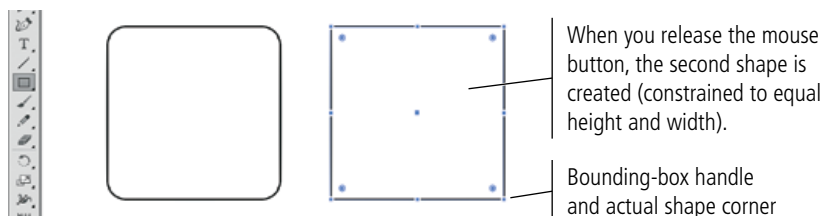
> *Note:*
>
> *If you do something wrong, or aren't happy with your results, press Command/Control-Z to undo the last action you took.*
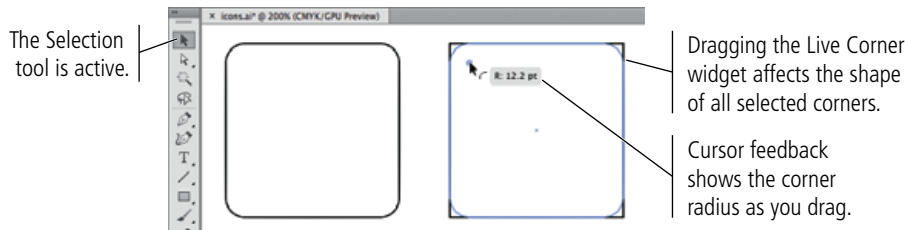
> *Note:*
>
> *If you press Option/Alt while dragging with a shape tool, the new shape is created from the center point out.*

12. **Using the Selection tool, click one of the Live Corner widgets and drag toward the center of the shape. When cursor feedback shows a corner radius of approximately 12 pt, release the mouse button.**

The Live Corner widgets allow you to manually adjust the corner radius of corners on the selected shape. Dragging in toward the shape center increases the corner radius; dragging out toward the corner decreases the corner radius.
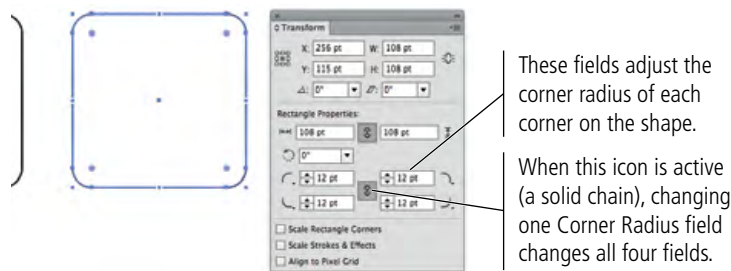
Because the entire object is selected (with the Selection tool), dragging any of the widgets applies the same change to all corners on the shape. To change only certain corners, you can use the Direct Selection tool to select the corner points you want to affect before dragging a Live Corner widget.

The Selection tool is active.

Dragging the Live Corner widget affects the shape of all selected corners.

Cursor feedback shows the corner radius as you drag.

13. **With the adjusted shape still selected, open the Transform panel.**

The Transform panel shows the corner radius of all four corners on the shape. If you find it difficult to achieve an exact radius by dragging, you can always use these fields to adjust the corner radius to specific values.

14. **Make sure the Constrain icon between the Corner Radius fields is active (a linked chain). Highlight any of the Corner Radius fields and type 12, then press Return/Enter to finalize the change.**

These fields adjust the corner radius of each corner on the shape.

When this icon is active (a solid chain), changing one Corner Radius field changes all four fields.

15. **Using the Selection tool, press Option/Alt, then click the second shape and drag right.**

When you drag an object with the Selection tool, you move it to another location. If you press Option/Alt while dragging, you clone the original object (make a copy of it) and move the clone.

This cursor indicates that you are cloning the shape as you drag.
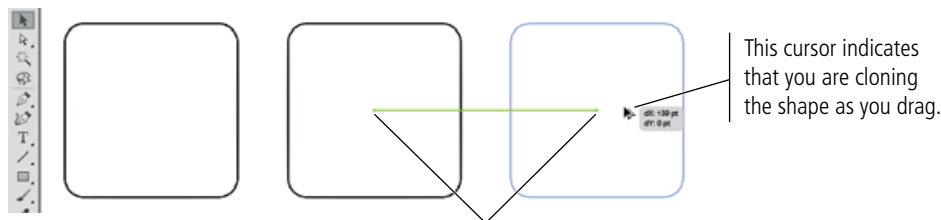
Smart guides make it easy to align the center of the cloned shape with the center of the original.

16. **Save the file and continue to the next exercise.**

More about Working with Live Corners

If a shape is an actual rectangle (with all 90° corners), the Live Corner widgets appear whenever the shape is selected with either Selection tool. For any other shape, including a four-cornered polygon with different-angled corners, the widgets appear only when the shape is selected with the Direct Selection tool.

Select the shape with the Direct Selection tool to access the Live Corner widgets.
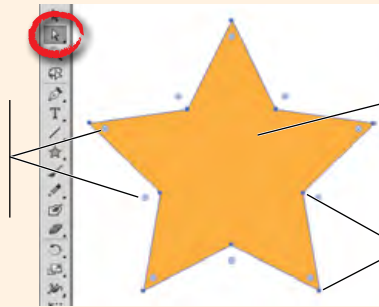
Click inside the shape to select the entire object (and all shape corners).

Click specific corner points to select only those corners.

If the entire object is selected, dragging any one Live Corner widget affects all corners on the same shape (below left). If you want to affect only specific corners, you can select those points first and then drag any of the visible widgets to change only the selected corners (below right).

Corner shapes have two rounding options, relative and absolute (the default). Using absolute corners, the radius between two connecting points exactly matches the defined value. Using relative corners, the corner curve is extended slightly to create a more natural-seeming shape.

In the example here, the red circle has the same radius value as the rounded corner on the underlying shape. The Absolute rounding method shows that the rounded corner exactly matches the same-radius circle; the Relative method shows how the corner curve extends slightly beyond the edge of the same-radius circle.

Option/Alt-clicking a Live Corner widget toggles through the available corner shapes (round, inverted round, and chamfer/beveled). Again, only selected corners are affected by the shape change.

Round corner	Inverted Round corner	Chamfer corner

Relative corner	Absolute corner

The Corners subpanel, available in the Control panel, can be used to change the shape, corner radius, and rounding of selected corners on non-rectangular shapes. (If you have a wide enough application frame, the Corner Radius field might appear directly in the Control panel. If you don't see it, you must click the Corners hot-text link to open the subpanel and its Corner Radius field.)
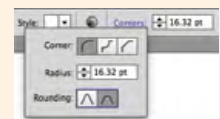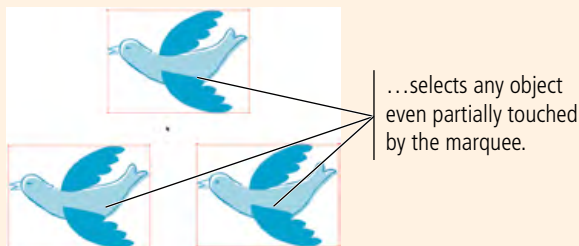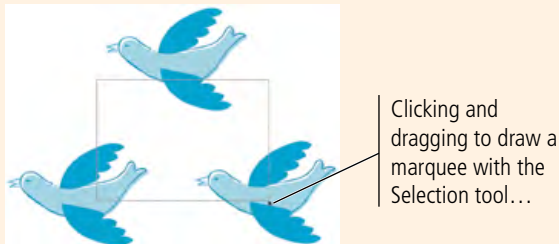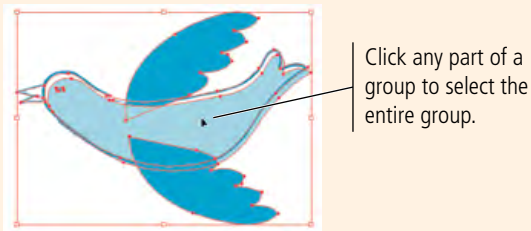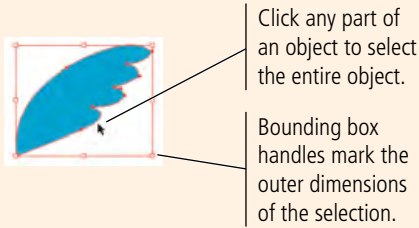
Selection Basics

Most Illustrator objects (including shapes like rounded-corner rectangles) contain two basic building blocks: anchor points and paths. These building blocks are the heart of vector graphics. Fortunately, you don't need to worry about the geometric specifics of vectors because Illustrator manages them for you — but you do need to understand the basic concept of how Illustrator works with anchor points and paths. You should also understand how to access those building blocks so you can do more than create basic shapes.

Path (line) segment

Curve handle controls the shape of the path
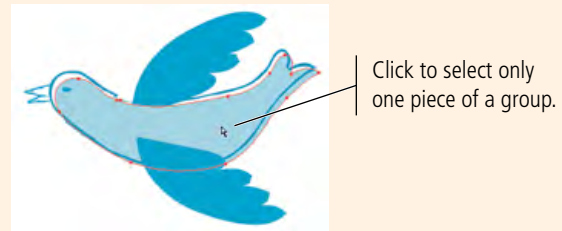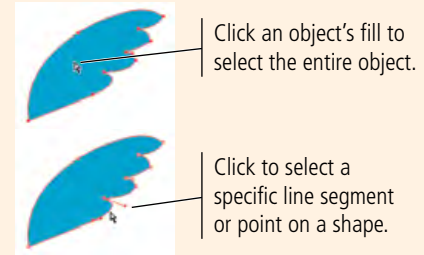
Anchor point
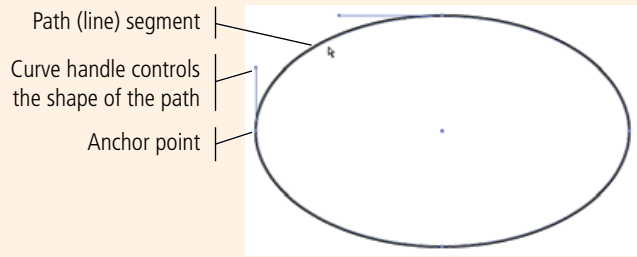
When you select an object with the **Selection tool** (the solid arrow), you can see the bounding box that identifies the outermost dimensions of the shape. Around the edges of the bounding box you see the bounding box handles, which you can use to resize the shape. (Press Command/Control-Shift-B to show or hide the bounding box of selected objects.)

When you select an object with the **Direct Selection tool** (the hollow arrow), you can see the anchor points and paths that make up the selected object rather than the object's bounding box. As you work with Illustrator, keep this distinction in mind: use the Selection tool to select an entire object; use the Direct Selection tool to edit the points and paths of an object.

Selection tool

Click any part of an object to select the entire object.

Bounding box handles mark the outer dimensions of the selection.

Click any part of a group to select the entire group.

Clicking and dragging to draw a marquee with the Selection tool…

…selects any object even partially touched by the marquee.

Direct Selection tool

Click an object's fill to select the entire object.

Click to select a specific line segment or point on a shape.

Click to select only one piece of a group.

Clicking and dragging to draw a marquee with the Direct Selection tool…

…selects only specific anchor points within the marquee.

# Transforming Objects with the Bounding Box

Bounding box handles make it easy to transform an object on the artboard. You can resize an object by dragging any handle, and even rotate an object by placing the cursor directly outside a corner handle. (If Smart Guides are active, cursor feedback helps if you want to make specific transformations, or you can work freestyle and drag handles until you're satisfied with the results.)
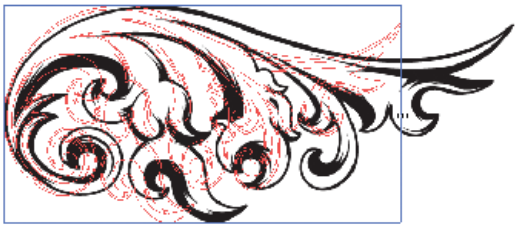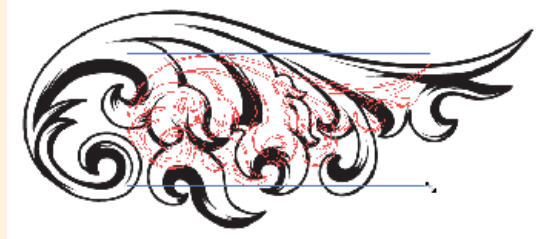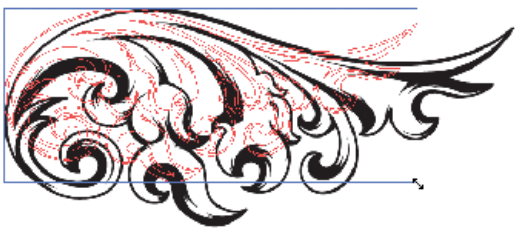
Drag a left- or right-center handle
to change the object's width.

Shift-drag to maintain an object's original
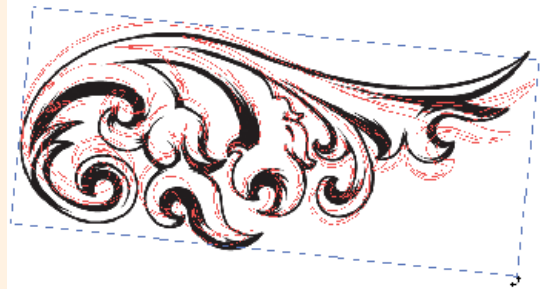height-to-width aspect ratio as you transform it.
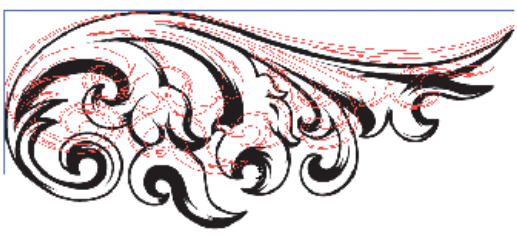
Drag a top- or bottom-center handle
to change the object's height.

Option/Alt-drag a handle to transform
the object around its center point.

Drag a corner handle to change both the
height and shape of an object at once.

Click directly outside an object's
corner handle to rotate the object.

Artwork used in these examples is takes from the built-in Adobe symbol libraries.

The Free Transform tool allows you to change the shape of selected objects by dragging the transformation handles.

The **Touch widget**, which you can use to change the active transformation mode, appears when the Free Transform tool is active. To move the Touch bar in the workspace, click away from the three buttons and drag to another location.

Transformation handles

When the cursor is over a transformation handle, the icon shows which distortions can be made.

Free Transform Touch widget

Constraint

Free Transform

Perspective Distort

Free Distort

Moving the mouse cursor over a handle shows the transformation that can be made by dragging that handle. Clicking one of the transformation handles shows a larger icon to indicate the possible transformation.
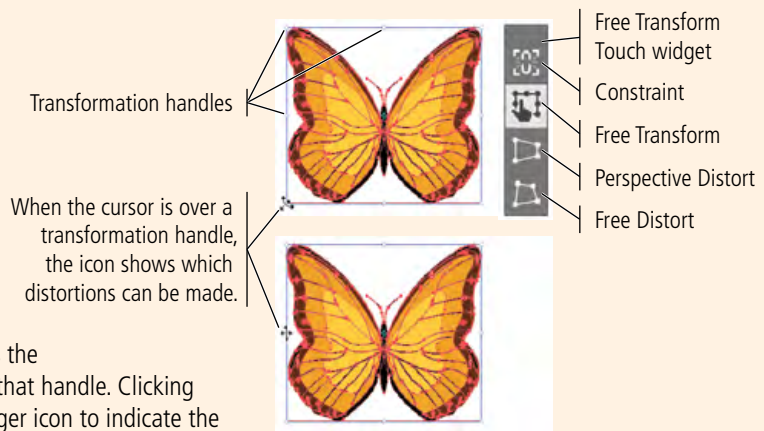
When you first select the Free Transform tool, the widget shows that the **Free Transform** mode is active. Larger transformation handles appear over all eight of the selected object's bounding box handles. In this case, most of the available transformations are the same as those you can make when the Selection tool is active (see Page 35).

Drag a corner handle diagonally in or out to scale the selection horizontally and vertically at the same time.

Drag a center handle perpendicular to the bounding box edge to scale the selection in one direction.

Drag a center handle parallel to the bounding box edge to skew the selection.

Click a corner handle and drag around to rotate the selection.

Press Option/Alt to apply the transformation around the center point.

Press Shift, or activate the Constraint option, to transform the selection proportionally (maintaining the original height-to-width aspect ratio).

If you activate the **Perspective Distort** option in the Touch widget, you can drag the object's corner transformation handles to change the object's perspective. (The Constraint option is not available when the Perspective Distort option is active.)
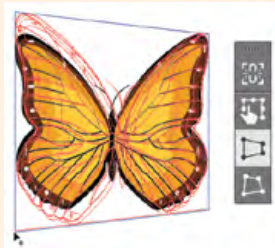
When the Free Transform mode is active, you can accomplish the same goal by clicking a corner handle, then pressing Command-Option-Shift/Control-Alt-Shift and dragging.

If you activate the **Free Distort** option, you can drag the corner transformation handles to distort the selection. When the Constraint option is active, you can only drag the corner exactly horizontal or vertical from its previous position.

When the Free Transform mode is active, you can accomplish the same goal by clicking a corner handle, then pressing Command/Control and dragging.

🖑 CONTROL FILL AND STROKE ATTRIBUTES

At the beginning of the previous exercise, you clicked the Default Fill and Stroke button in the Tools panel to apply a white fill and 1-pt black stroke to the objects you created. Obviously, most artwork requires more than these basic attributes. Illustrator gives you almost unlimited control over the fill and stroke attributes of objects on the artboard.

As you complete the projects in this book, you will learn about styles, patterns, gradients, effects, and other attributes that can take an illustration from flat to fabulous. In this exercise, you learn about a number of options for changing the basic fill, stroke, and color attributes for objects on the page.

1. **With icons.ai open, choose the Selection tool at the top of the Tools panel. Click the left rectangle on the artboard to select it.**

   The Selection tool is used to select entire objects.

2. **Choose View>Hide Corner Widget.**

   These widgets can be distracting, so it's useful to turn them off when they are no longer needed.

   The Selection tool is active.

   Bounding-box handles are still visible.

   Live Corner widgets are no longer visible.
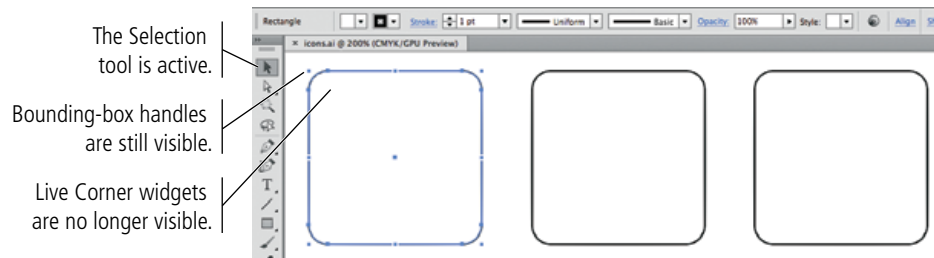
3. **Open the Swatches panel. If the panel shows a list of items including the color names, open the Swatches panel Options menu and choose Small Thumbnail View.**

   The Swatches panel includes a number of predefined and saved colors, which you can use to change the color of the fill and stroke of an object. You can also save custom swatches to more efficiently apply custom colors as you create artwork.
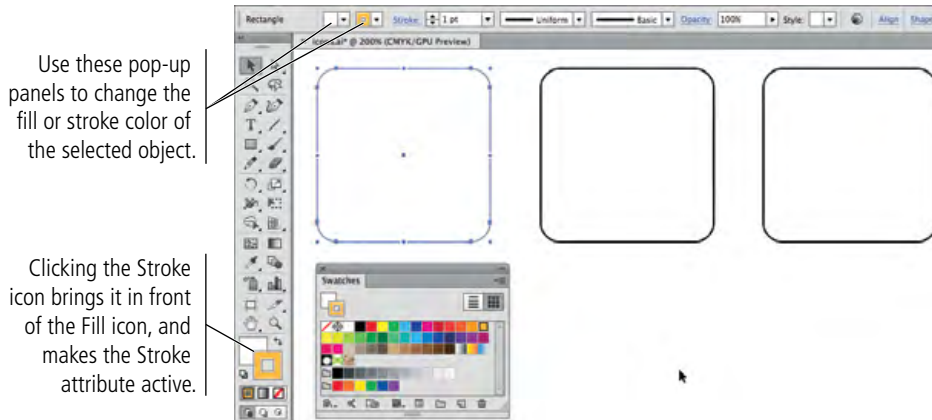
   Click here to open the panel Options menu.

   View items in the panel as thumbnails or as a list.
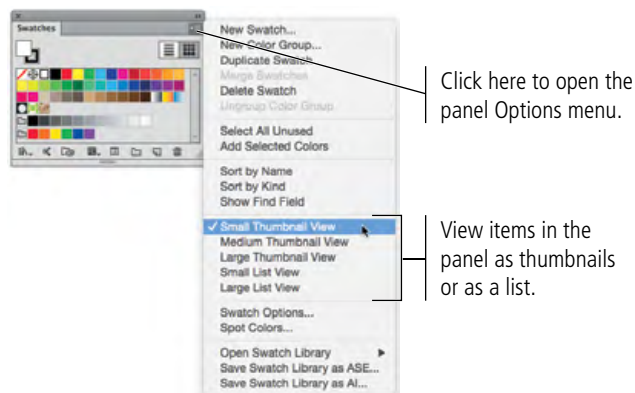
Note:

Remember, panels can always be accessed in the Window menu.

4. **Near the bottom of the Tools panel, click the Stroke icon to bring it to the front of the stack.**

   The fill and stroke icons in the Tools panel are used to change the color of the related attributes. Clicking one of these buttons brings it to the front of the stack (makes it active) so you can change the color of that attribute.
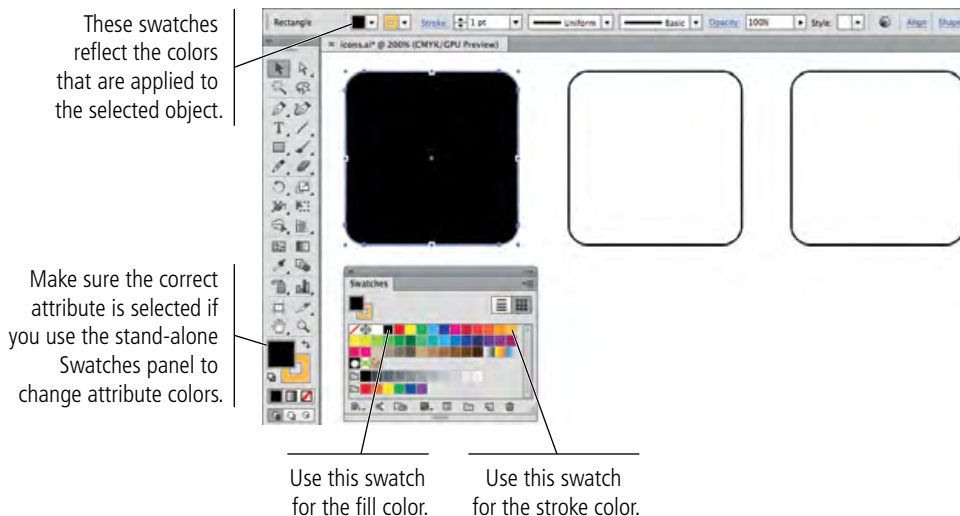
Use these pop-up panels to change the fill or stroke color of the selected object.

Clicking the Stroke icon brings it in front of the Fill icon, and makes the Stroke attribute active.

5. **In the Swatches panel, click the gold swatch at the end of the first row.**

   Because the Stroke icon is active in the Tools panel, the color of the selected object's stroke (border) changes to gold.

6. **In the Tools panel, click the Fill icon to bring it to the front of the stack. In the Swatches panel, click the black swatch in the first row.**

   Because the Fill icon is active in the Tools panel, clicking the black color swatch changes the fill color of the selected object.

These swatches reflect the colors that are applied to the selected object.

Make sure the correct attribute is selected if you use the stand-alone Swatches panel to change attribute colors.

Use this swatch for the fill color.

Use this swatch for the stroke color.

7. **Open the Stroke panel. With the rounded rectangle selected, change the Stroke Weight field to 3 pt and press Return/Enter to apply the change.**

    The Stroke icon in the Tools panel does not need to be active to change the stroke weight. The Tools panel icons relate only to color changes made with the stand-alone Swatches or Color panels.

Change the Stroke Weight field to 3 pt.

The Stroke icon doesn't need to be on top to change an object's stroke weight.
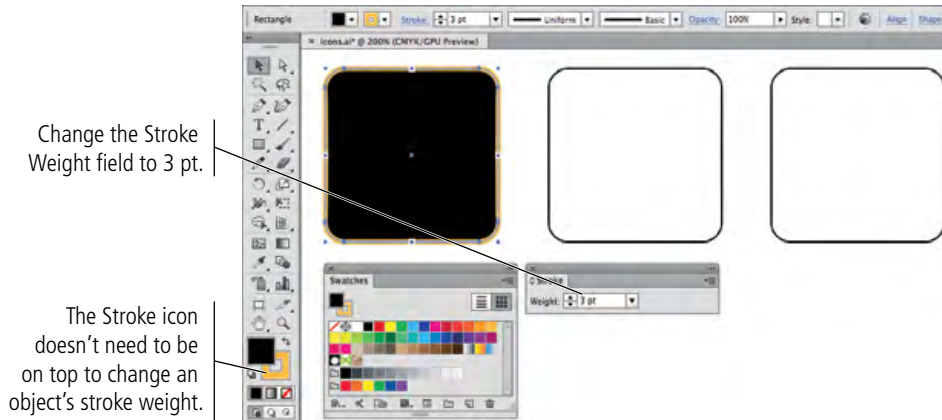
8. **With the rectangle still selected, click the Swap Fill and Stroke button in the Tools panel.**

    This button makes it easy to reverse the fill and stroke colors of an object; the stroke weight remains unaffected when you swap the colors.
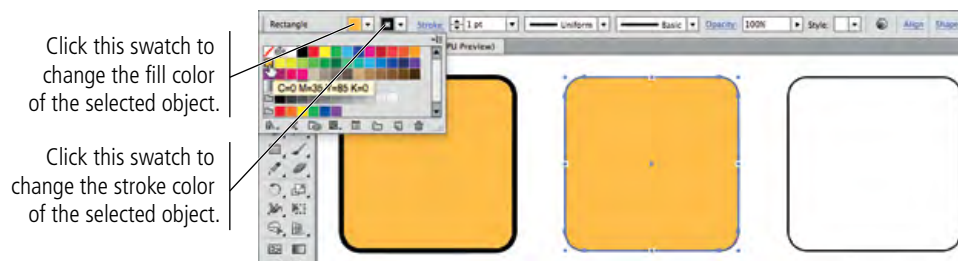
Click the Swap Fill and Stroke button to reverse the color attributes of the selected object.
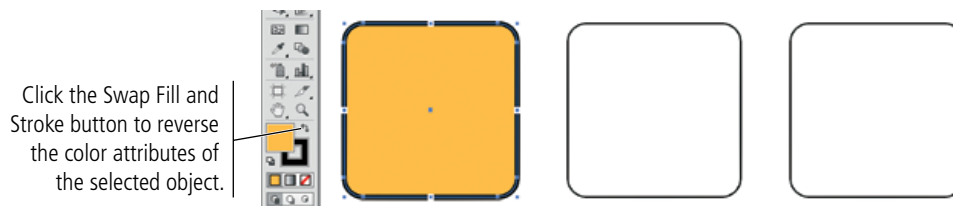
9. **Using the Selection tool, click the second rectangle on the artboard.**

    The Fill and Stroke icons change to reflect the colors of the selected objects.

10. **Click the Fill color swatch in the Control panel. Choose the gold swatch in the second row to change the fill color for the selected object.**

    When an object is selected with the Selection tool, the Control panel provides quick access to the stroke and fill attributes of the selected object.

    Clicking the Fill color swatch opens an attached Swatches panel so you can change the fill for the selected object without opening the separate Swatches panel.

Click this swatch to change the fill color of the selected object.

Click this swatch to change the stroke color of the selected object.

11. **In the Control panel, change the Stroke Weight value to 3 pt.**

Again, the Control panel options allow you to change the attribute value without opening the Stroke panel. The Control panel can be a significant time-saver for common operations such as changing stroke and fill attributes.


Use the menu or type a value in the attached field to change the stroke weight of the selected object.
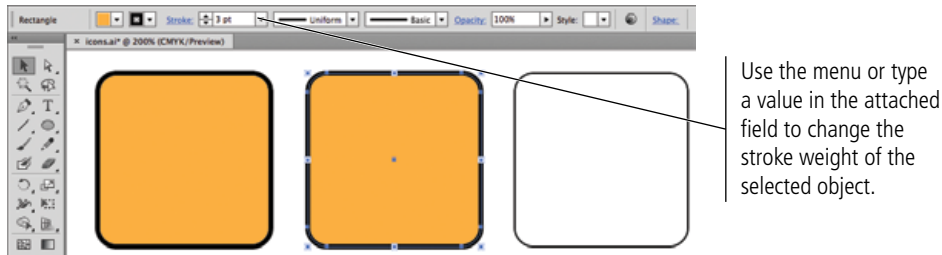
12. **Using the Selection tool, click the third rectangle on the artboard.**

Again, the Fill and Stroke icons in the Tools panel change to reflect the colors of the selected object.

13. **Select the Eyedropper tool in the Tools panel, and then click the first or second rectangle on the artboard.**

The Eyedropper tool copies fill and stroke attributes from one object (the one you click) to another (the one you first selected).
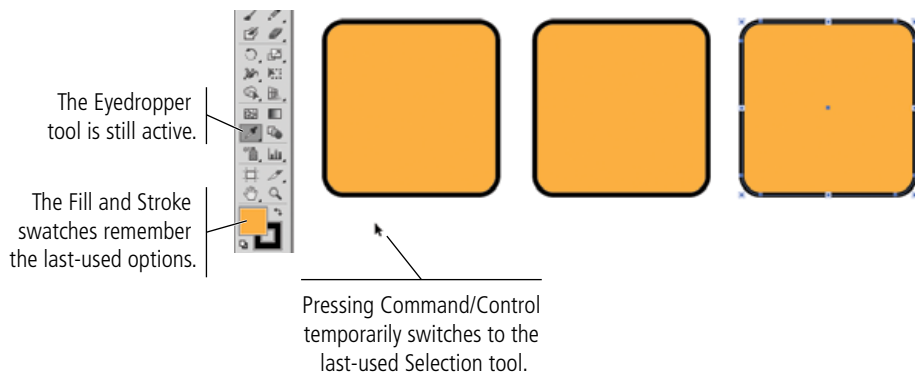

Eyedropper tool

Clicking copies the stroke and fill attributes of the clicked object onto the selected object.

Selected object
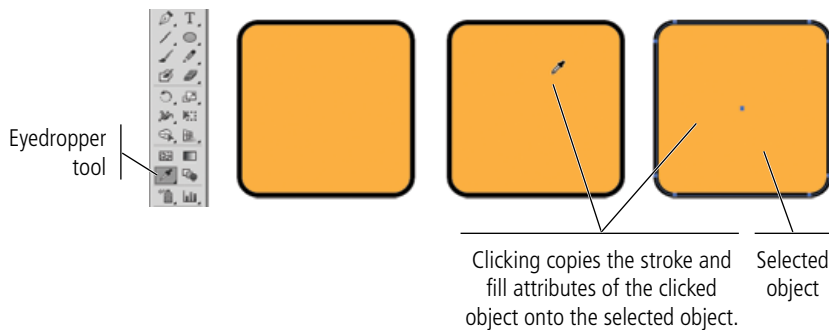
Note:

You can double-click the Eyedropper tool in the Tools panel to define which attributes are picked up and applied by clicking with the tool.

14. **Press and hold the Command/Control key, and click anywhere on the artboard away from the three rectangles.**

Pressing Command/Control temporarily switches to the Selection tool. By clicking on the empty artboard area while holding down the modifier key, you can quickly deselect the selected object(s). When you release the Command/Control key, the tool reverts to the one you last used — in this case, the Eyedropper tool.


The Eyedropper tool is still active.

The Fill and Stroke swatches remember the last-used options.

Pressing Command/Control temporarily switches to the last-used Selection tool.

15. **Release the Command/Control key.**

16. **Choose the Rounded Rectangle tool in the Tools panel.**

17. **To the right of the third shape on the artboard, draw a fourth rounded rectangle that is 108 pt square.**

    The Fill and Stroke swatches remember the last-used options, so the new rectangle has the same heavy black stroke and gold fill as the others. Don't worry if your shapes aren't entirely on the artboard; you will define their precise position in the next exercise.
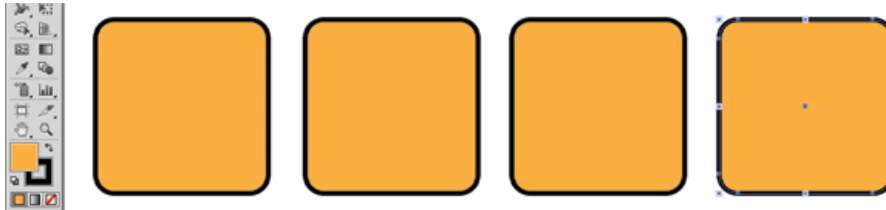
18. **Save the file (File>Save or Command/Control-S) and continue to the next exercise.**

CONTROL OBJECT POSITIONING

The ability to move objects around on the artboard is one of the advantages of digital drawing. On paper, you have to manually erase items and then redraw them in their new locations. Illustrator offers a number of tools that make it easy to move objects around the artboard, either as isolated objects or in relation to other elements on the page. In this exercise, you learn several techniques for moving objects on the artboard.

1. **With icons.ai open, change your zoom percentage so you can see all four shapes and the entire top of the artboard.**

2. **Choose View>Rulers>Show Rulers to show the rulers at the top and left edges of the document window.**

    Because you created this file using points as the default unit of measurement, the rulers — and fields in dialog boxes and panels — show measurements in points.

3. **Control/right-click the top ruler and choose Inches from the contextual menu.**
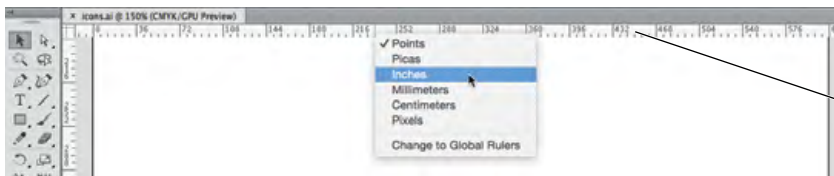
Rulers on the top and left edges show measurements in the default units of measurement.

4. **Choose the Selection tool from the top of the Tools panel. Click the left rectangle on the artboard to select it.**

5. **With the left rectangle selected, look at the right side of the Control panel. If you have a smaller monitor and see the word "Transform," click it to open the pop-up Transform panel.**

What you see in the Control panel depends on the size of your monitor (or the size of your Application Frame if you've made it smaller than your monitor).

If you have a wide monitor, the reference point proxy and the X, Y, W, and H fields of the Transform panel are available directly in the Control panel.

If you have a smaller monitor that does not allow these fields to fit, the Control panel includes a hot-text link to the Transform panel. Clicking the link opens the Transform panel as a pop-up, directly below the Control panel; after you make a change in the pop-up panel, it collapses back into the Control panel.
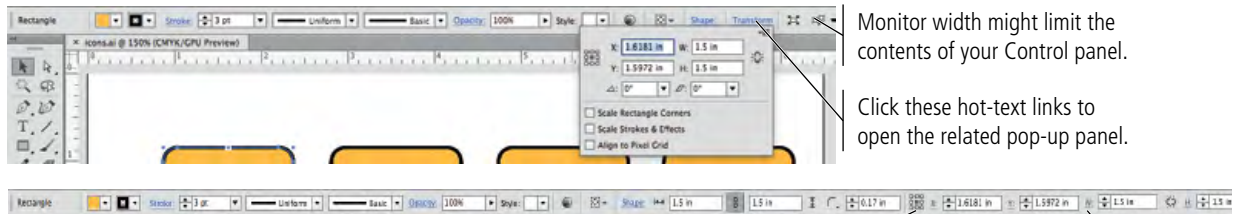
Monitor width might limit the contents of your Control panel.

Click these hot-text links to open the related pop-up panel.

With a wider monitor, you can access most Transform panel options directly in the Control panel.

Click these hot-text links to open the full pop-up panel.

6. **Review the Transform options.**

The reference points correspond to the bounding box handles of the selected object. The selected square in this icon identifies which point of the object is being measured.

If you use the W or H fields to resize an object, you can constrain the object's height-to-width aspect ratio by clicking the chain icon (right of the W and H fields in the Transform panel, or between the W and H fields in the Control panel).
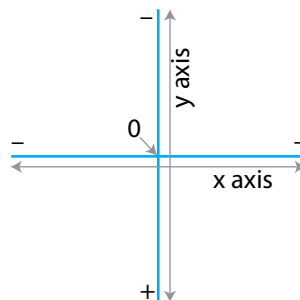

Reference point
around which numeric transformations are based

In Illustrator, the default **zero point** (the source of measurements) is the top-left corner of the artboard; the X and Y positions of an object are measured relative to that location. (The X axis is the horizontal value and the Y axis is the vertical value.) Keep these ideas in mind when you move something in an Illustrator file:

- Moving up requires subtracting from the Y value.
- Moving down requires adding to the Y value.
- Moving left requires subtracting from the X value.
- Moving right requires adding to the X value.

7. **Using either the pop-up Transform panel or the option directly in the Control panel, click the top-left reference point to select it.**

The X and Y fields now show the exact position of the top-left bounding box handle for the selected object.

8. **Highlight the X field and type .5. Press Return/Enter to apply the change.**

You don't need to type the measurement unit (″), or the preceding "0". Because the rulers are showing inches, Illustrator automatically applies inches as the unit of value.
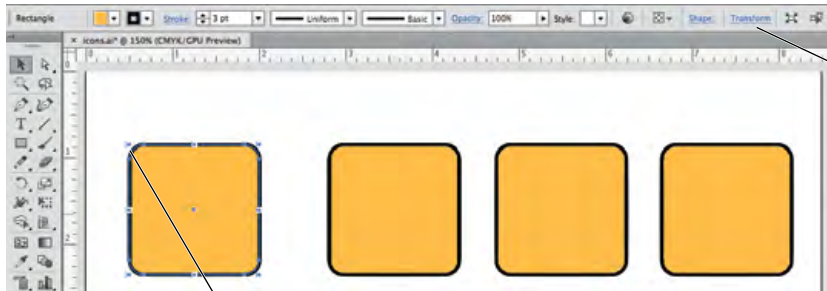
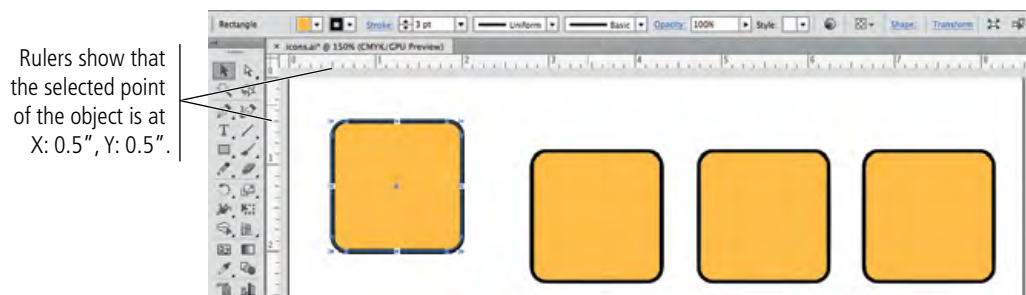The pop-up panel collapses when you press Return/Enter to apply the change.

Because the top-left reference point is selected, measurements correspond to this point of the selected shape.

If you used the pop-up Transform panel, the panel collapses as soon as you press Return/Enter. You will have to click the Transform link again to complete the next step.

9. **Highlight the Y field and type .5. Press Return/Enter to apply the change.**

The top-left handle of the selected object is now 1/2″ from the top and left edges. The numbers you typed correspond to the measurements you see on the rulers.

As with dialog boxes, you can enter values in a unit of measurement other than the default, as long as you remember to type the unit abbreviation.

Note:

When a field value is highlighted in a panel or dialog box, you can use the Up Arrow and Down Arrow keys to increase or decrease (respectively) the highlighted value.

Rulers show that the selected point of the object is at X: 0.5″, Y: 0.5″.

10. **Using the Selection tool, click the second rectangle on the artboard and drag until a green line appears, connecting the center points of the first and second shapes.**

As you drag the cursor, feedback shows the relative position of the object. In other words, you can see the change (<u>d</u>ifference) in the object's position, both horizontally (<u>X</u>) and vertically (<u>Y</u>) — hence the "dX" and "dY" values.

In addition to providing cursor feedback, Smart Guides can be very useful for aligning objects on the artboard. As you drag, Illustrator identifies and highlights relative alignment, and snaps objects to those alignment points as you drag.
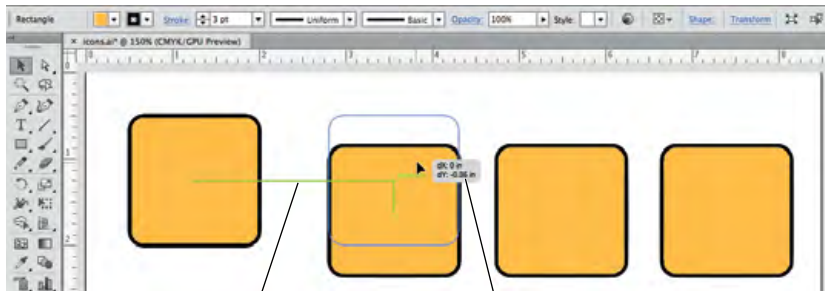
Smart guides make it easy to align multiple objects.

The dX and dY values show the changes to the object's X and Y values.

11. **Release the mouse button while the center Smart Guide is visible.**

If you don't see the alignment guides as you drag, make sure that option is checked in the Smart Guides preferences.

12. **Click the fourth shape on the page. In the Control or Transform panel, select the top-right reference point, type 8 in the X field, and type .5 in the Y field.**

The top-right reference point means the X and Y values refer to the top-right corner of the selected shape.
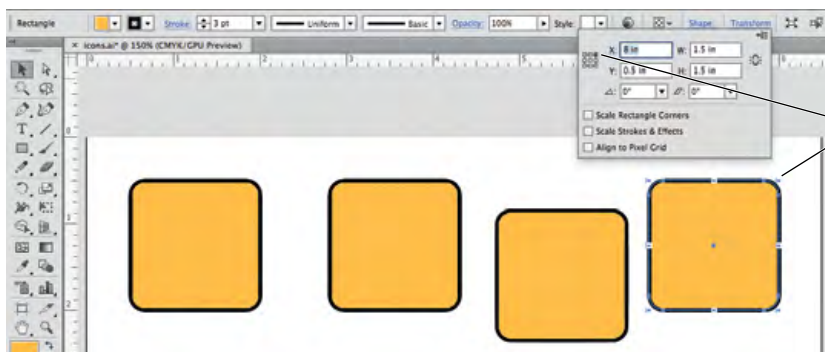
Because you changed the reference point, you defined the X/Y position for the top-right bounding box handle of the fourth rectangle.

13. **Save the file and continue to the next exercise.**

ALIGN AND DISTRIBUTE OBJECTS
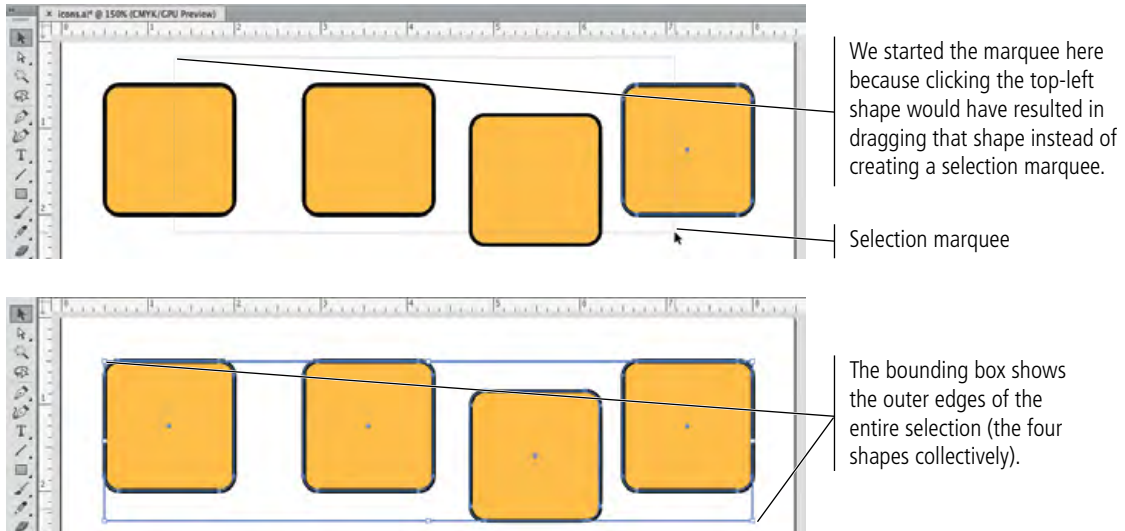
In addition to dragging objects around the artboard, the Illustrator Align panel makes it very easy to align and distribute selected objects relative to one another, to a specific key object in the file, or to the overall artboard. In this exercise, you learn how to use the Align panel to align shapes.
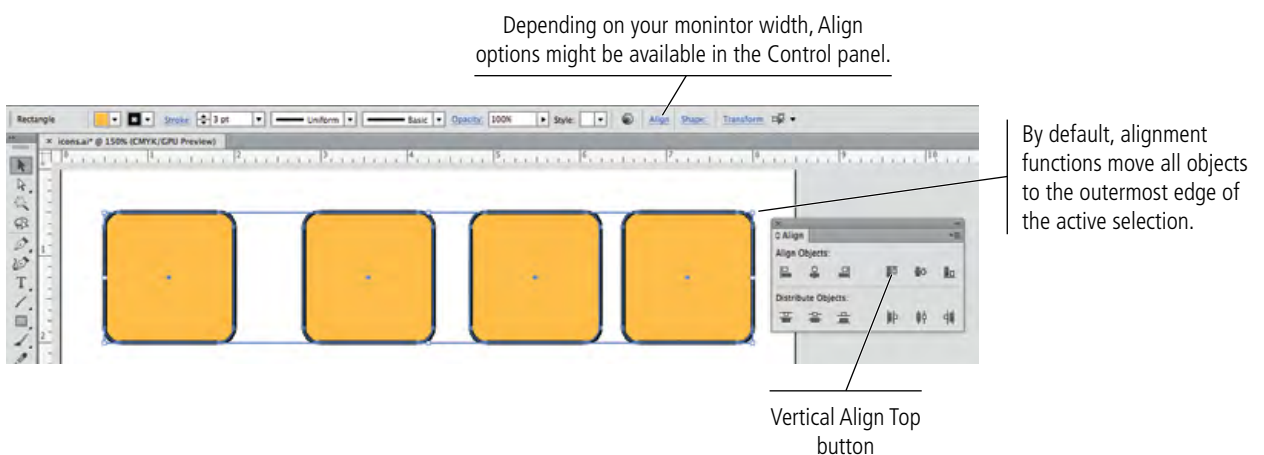
1. **With icons.ai open, click and drag with the Selection tool to draw a marquee that touches some part of all four objects on the artboard.**

   The Selection tool selects objects, so the selection marquee only needs to touch the objects you want to select. The marquee doesn't need to surround the objects entirely.

We started the marquee here because clicking the top-left shape would have resulted in dragging that shape instead of creating a selection marquee.

Selection marquee

The bounding box shows the outer edges of the entire selection (the four shapes collectively).

2. **Open the Align panel (Window>Align) and click the Vertical Align Top button.**

   By default, alignment and distribution functions occur relative to the selected objects. In other words, when you click the Vertical Align Top button, Illustrator determines the topmost edge of the selected objects, and then moves the top edges of all other selected objects to that position.

Depending on your monintor width, Align options might be available in the Control panel.

By default, alignment functions move all objects to the outermost edge of the active selection.

Vertical Align Top button

3. **With all four objects selected, click the Horizontal Distribute Center button.**

By default, the distribution functions create equal distance between the selected point of the selected objects. In this case, Illustrator distributed the center points along the horizontal axis by determining the center positions of the outermost selected objects, and then moving the middle two objects to create equal distance between the centers of all four selected objects; the positions of the two outer objects remained unchanged.

The outer edges of the selected objects remain unchanged.

Horizontal Distribute Center button
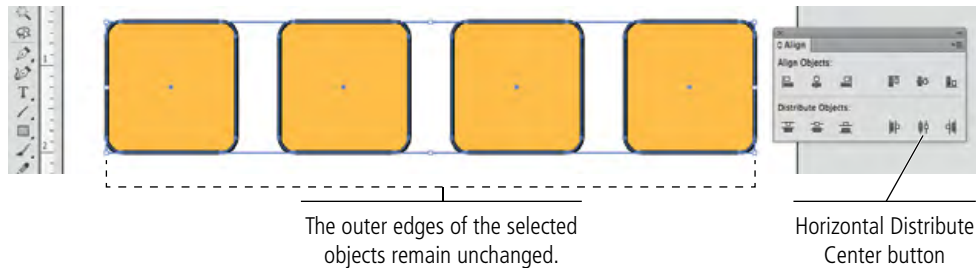
4. **With all four objects selected, choose Object>Group.**

When you group multiple objects, the group is essentially treated as a single object. A single bounding box surrounds all objects within the group.

5. **Click inside any of the grouped objects; while still holding down the mouse button, press Option/Alt and drag down.**
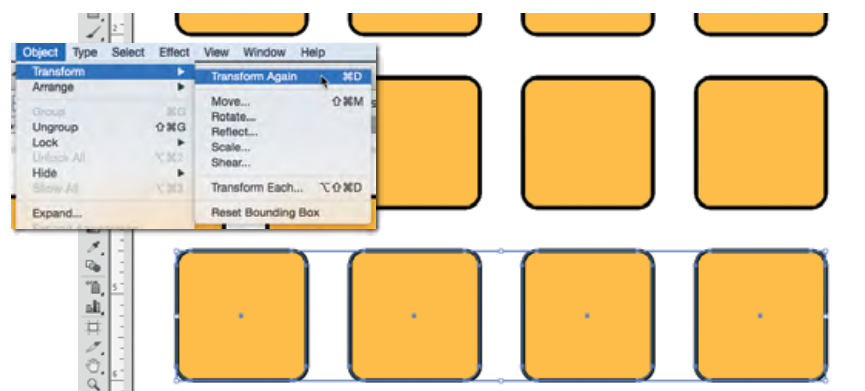
6. **Use the Smart Guides and cursor feedback to drag exactly vertical (the dX value should be 0). When the dY value in the cursor feedback is 2 in, release the mouse button.**

Remember, pressing Option/Alt while you drag clones the original selection.

The cursor icon shows that you are cloning instead of simply dragging.

Cursor feedback makes it easy to move something to precise locations.

7. **With the second group of rectangles selected, choose Object>Transform>Transform Again.**

This command repeats the last-used transformation. In this case, the last transformation was the cloning movement, so it creates the third row of rectangles.

Note:

There is almost always more than one way to accomplish a specific task. The Align panel is useful for certain functions (especially distribution), but Smart Guides make object-to-object alignment very easy.

Note:

Press Command/Control-D to repeat the last-used transformation.

8. **Click anywhere outside the rectangle shapes to deselect all objects and groups.**

9. **Save the file and continue to the next exercise.**

✍ EDIT INDIVIDUAL GROUPED ELEMENTS

The client in this project requested only ten icons, so you don't need two of the rectangles in the third row. As you know, the Selection tool selects entire objects on the page. You also know that grouped objects are treated as a single object — which means you can't use the Selection tool to select part of a group. In this exercise, you use two techniques to work with component pieces of a group.

1. **With icons.ai open, use the Selection tool to click the fourth rectangle in the third row.**

   Because the four objects are grouped, the Selection tool selects the entire group. You need to use a different method to select certain elements within the group.
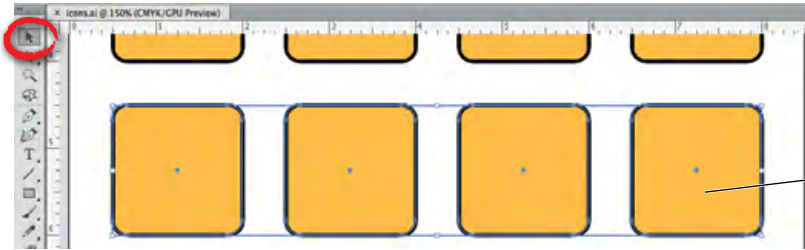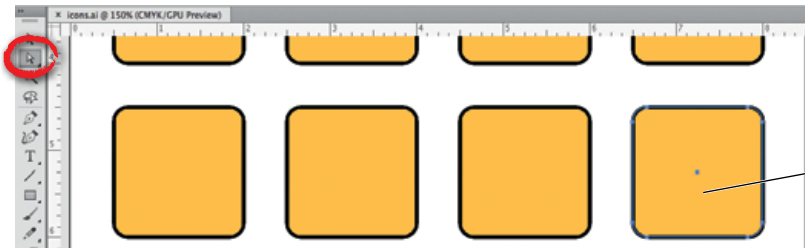

Because this object is part of a group, the Selection tool selects the entire group.

2. **Click anywhere outside the rectangle shapes to deselect the group, then choose the Direct Selection tool in the Tools panel.**

   The Direct Selection tool selects pieces of an object — specific paths, anchor points, or individual elements in a grouped object.

3. **Click the gold fill of the fourth rectangle in the third row.**

   Because you clicked the fill, you selected the entire object. If you had clicked along the object's stroke, you would have selected that particular segment of the shape's edge.

Clicking an object's fill with the Direct Selection tool selects only that object, even though the object is part of a group.
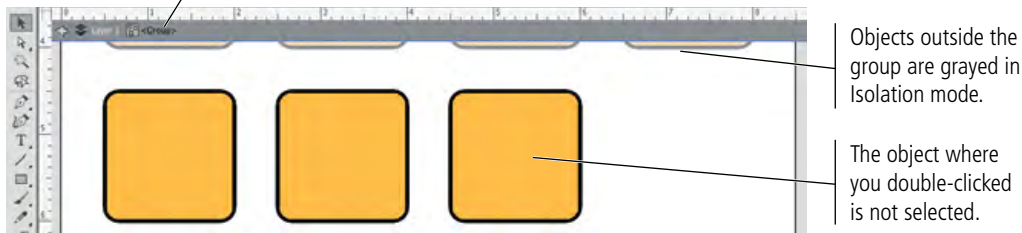
4. **Press Delete to remove the selected object.**

   Easy enough, especially because this is a very simple group of objects that don't overlap. When you start working with complex files that have multiple levels of grouping, however, it can be challenging to manipulate objects within a group using only the Direct Selection tool.

Note:

Think carefully about your ultimate goal when you group objects, especially for alignment purposes. If the objects in a group don't need to stay together, it's often a good idea to ungroup them.

5. **Choose the Selection tool in the Tools panel, and then double-click the third rectangle in the third row.**
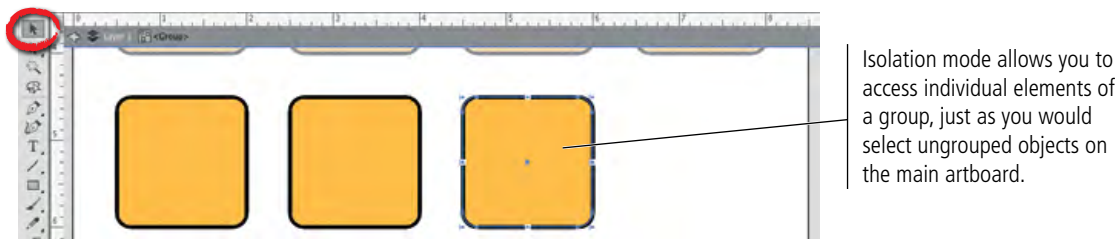
   Double-clicking a group enters into **Isolation mode**, where only objects within the selected group are available. Basically, Isolation mode provides access to objects in the group without ungrouping the objects on the main artboard.

   "Breadcrumbs" in the Edit bar show the path to the active selection.

   Objects outside the group are grayed in Isolation mode.

   The object where you double-clicked is not selected.

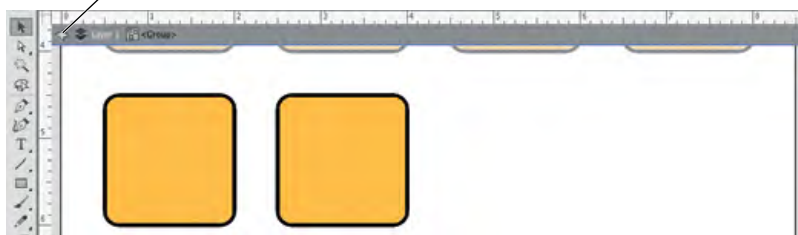6. **Using the Selection tool, click the third rectangle in the third row to select it, and then press Delete.**

   Because you created only a single level of grouping, you can now use the Selection tool to select individual objects.

   Isolation mode allows you to access individual elements of a group, just as you would select ungrouped objects on the main artboard.

7. **At the top of the document window, click the Arrow button twice to return to the main artboard.**

   You can also double-click away from the isolated artwork, or press the ESC key, to exit Isolation mode.

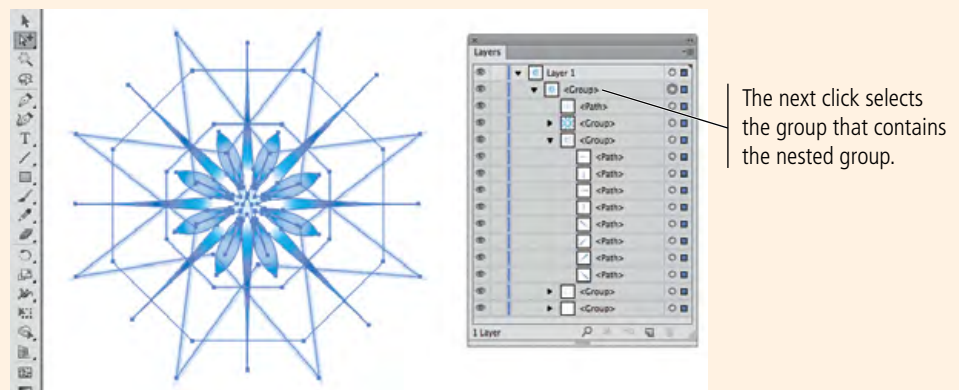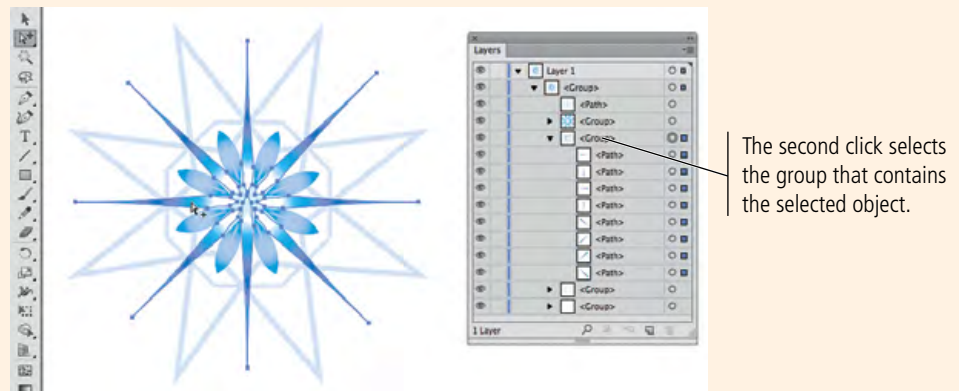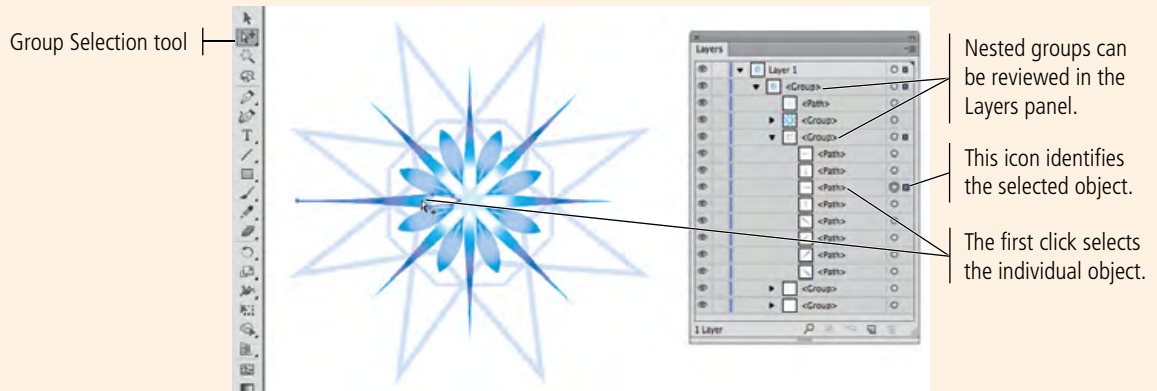   Click this button to exit Isolation mode.

   The third row, now with two rectangles, is still a single group on the main artboard.

8. **Save the file and continue to the next exercise.**

ILLUSTRATOR FOUNDATIONS

You can create more than one level of group, called **nesting**, by selecting an existing group and grouping it with other objects or groups. You can use the **Group Selection tool** to help navigate complex levels of nested groups.

The first click with the Group Selection tool selects an individual object in a group. The second click selects that object's containing group. The third click adds the next containing group to the selection, and so on until the entire parent group is selected.

Group Selection tool

Nested groups can be reviewed in the Layers panel.

This icon identifies the selected object.

The first click selects the individual object.

The second click selects the group that contains the selected object.

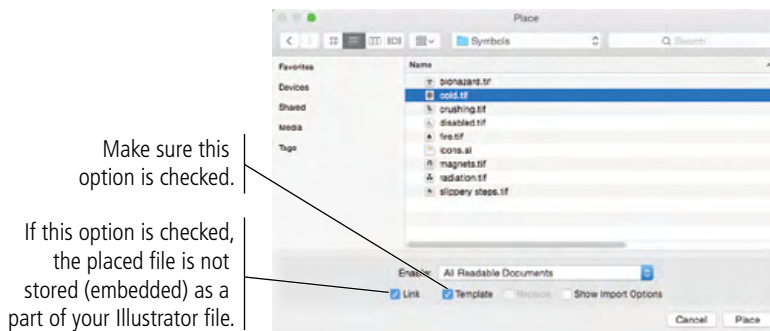The next click selects the group that contains the nested group.

Many Illustrator projects require you to start with something that has already been captured — a sketch, photograph, or low-resolution image (which is the case in this project). Illustrator makes it easy to place existing digital files to use as templates for your new artwork. You will use this feature in this exercise.

1. **With `icons.ai` open, choose File>Place. Navigate to your WIP>Symbols folder and click `cold.tif` to select that file.**

2. **At the bottom of the Place dialog box, check the Template option.**

   If you check the Link option, the placed file does not become a part of the actual file where you're working; for the file to output properly, Illustrator must be able to locate the linked file in the same location (hard drive, CD, etc.) as when you placed it. If the Link option is *not* checked, the placed file is **embedded** — it becomes part of the file where it's placed; the original external file is not necessary for the artwork to output properly. We will explore the details of placed files in later projects.
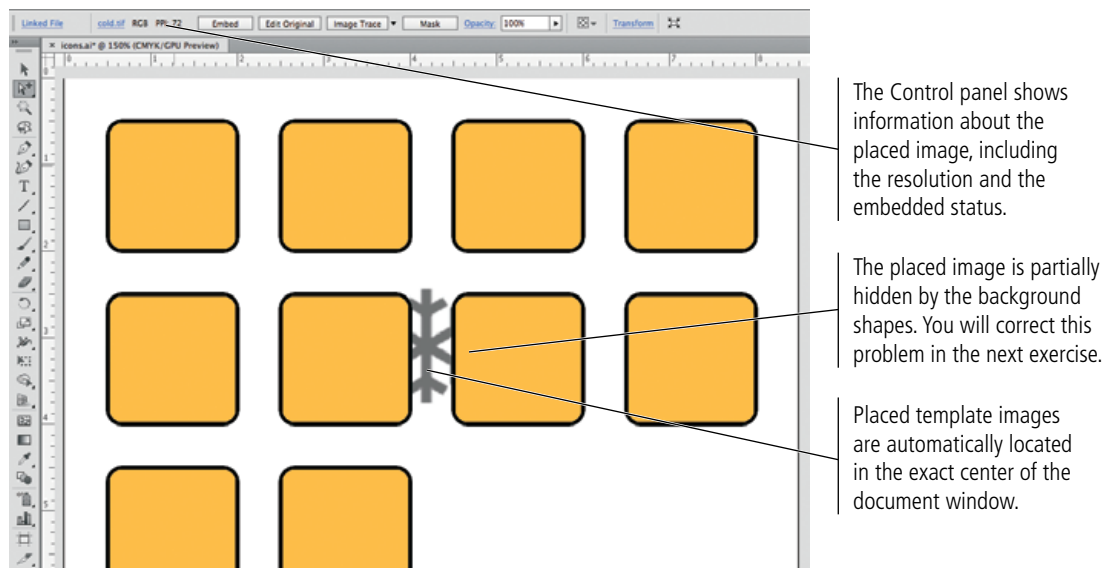
   In the case of this project, you are going to delete the template images after you create the artwork; it doesn't matter if the images are linked or embedded.

   When you place an object as a template, it's added to the file on a separate, non-printing layer that is partially grayed, making it easier to work with.

Make sure this option is checked.

If this option is checked, the placed file is not stored (embedded) as a part of your Illustrator file.

3. **Click Place.**

   When you place an object into Illustrator as a Template, it is automatically centered in the current document window.

The Control panel shows information about the placed image, including the resolution and the embedded status.

The placed image is partially hidden by the background shapes. You will correct this problem in the next exercise.

Placed template images are automatically located in the exact center of the document window.

4. **Choose File>Place a second time. Select `radiation.tif` in the list, check the Template option, and click Place.**

The Place dialog box remembers the last-used location, so you don't have to re-navigate to the Symbols folder. The Link option also remembers the last-used settings. The Template option, however, always defaults to off, so you have to manually check this box for each template object.
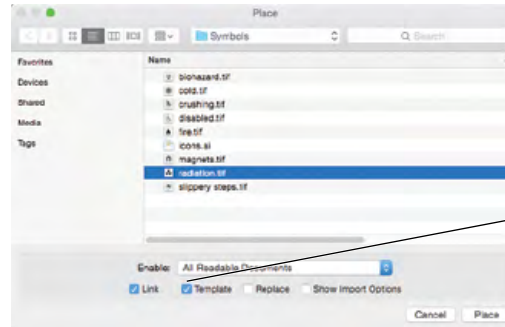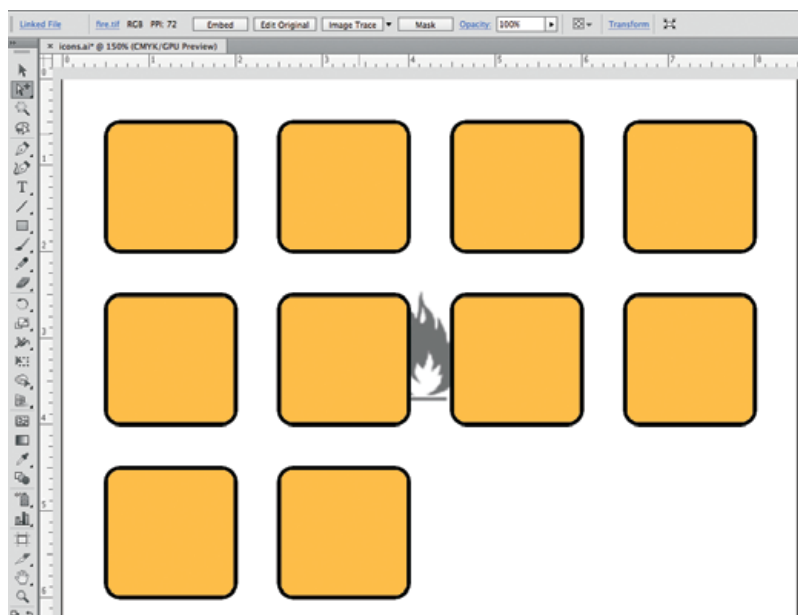

Make sure you remember to check the Template option.
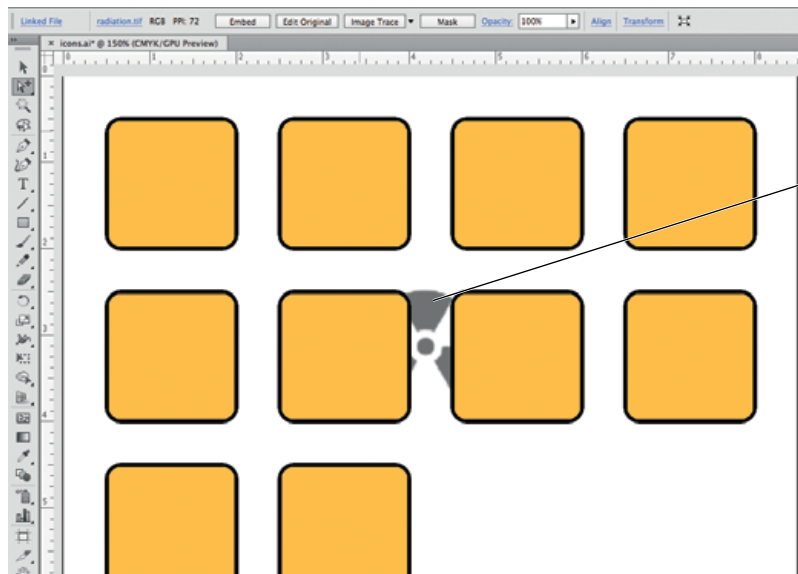
This image is also placed in the center of the document window, directly on top of the first placed image.

5. **Repeat Step 4 to place `fire.tif` into your file as a template image.**

Note:

If you change the view percentage or scroll the document in the window before placing the second image, the second file will not be centered over the first. Instead, it will be centered in the document window based on the current view.
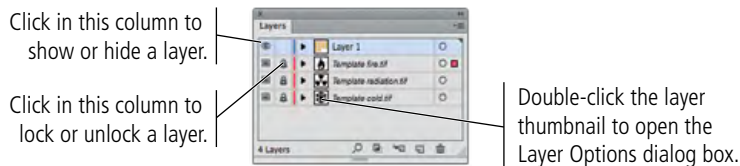
6. **Save the file and continue to the next exercise.**

MANAGE MULTIPLE LAYERS

When you create artwork in Illustrator, you almost always end up with more than one object on the artboard. In many cases, a completed file has dozens or hundreds of objects, arranged in specific order on top of one another. As files become more and more complex, it can be difficult to find and work with exactly the pieces you need. Illustrator layers are one of the most powerful tools available for solving this problem.

1. **In the open `icons.ai` file, open the Layers panel.**

    By default, all files have a single layer, named Layer 1. Your file has three additional layers — the template layers — below Layer 1. Template layers are locked by default, which means you can't select or modify objects on those layers.
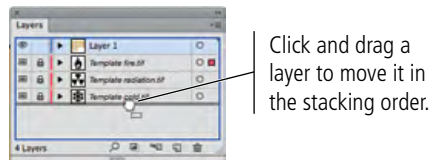
    Click in this column to show or hide a layer.

    Click in this column to lock or unlock a layer.

    Double-click the layer thumbnail to open the Layer Options dialog box.

    Note:

    If you don't see all three locked template layers, you forgot to check the Template option when you placed one of the images. You can select and delete the placed file from the artboard, then replace the necessary image as a template.

2. **In the Layers panel, click the Layer 1 name and drag it below all three template layers in the stack.**
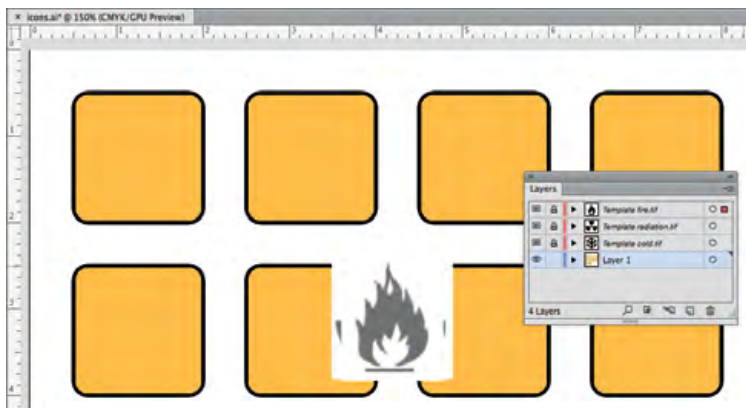
    The top-to-bottom position of objects or layers is called the **stacking order**. Objects and layers typically appear in the stack based on the order in which they are created — the first-created is at the bottom, the last-created is at the top, and so on in between.

    Click and drag a layer to move it in the stacking order.

    Note:

    For a template layer, the Visibility icon is a small square instead of an eye.

    Placed template objects are the exception; these layers are placed *below* the currently selected layer (i.e., lower in the stacking order). In this case, the rectangle shapes are filled with a color, which obscures the template images on the underlying layers. To see the template images, you need to move the template object layers above the layer containing the background shapes. Rather than moving three layers above Layer 1, you can save a few clicks by moving Layer 1 below all of the template layers.

3. **Using the Selection tool, click the top-left rounded rectangle to select it.**

    Remember, this object is grouped with the other rectangles in the same row. You need to align the placed object to only the first rectangle, which means you need to be able to select only that object. As you saw in an earlier exercise, you can use Isolation mode to access a single element of a group. However, each rectangle shape is ultimately going to be a separate icon; you're simply creating them all in the same workspace. The best choice here is to simply ungroup the rectangles, returning them to individual objects.

4. **With the top-row group selected, choose Object>Ungroup.**

You can also press Command/Control-Shift-G to ungroup objects in a group.

5. **Click away from the selected objects to deselect them, and then click the top-left rectangle to select that object only.**
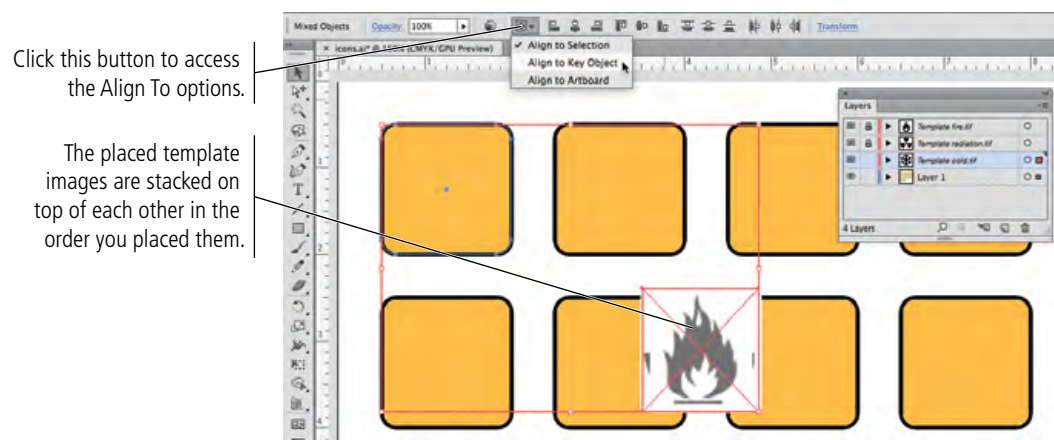
6. **In the Layers panel, click the Lock icon for the Template cold.tif layer.**

Because you need to move the placed template object into the correct position, you first need to unlock the layer.
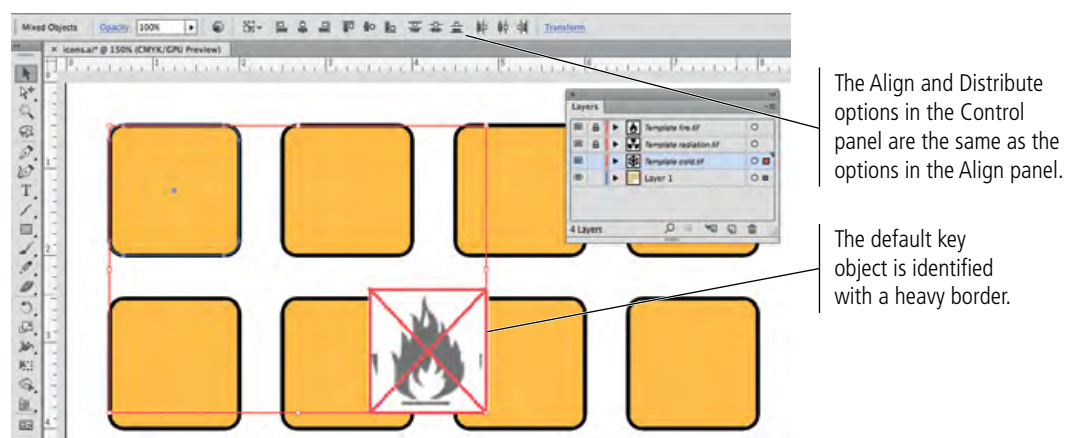
7. **With the Selection tool still active, press Shift and click anywhere inside the area where the template images are placed.**

Pressing Shift allows you to add objects to the current selection. The first rectangle and the image should both be selected. (Remember, the other two template object layers are still locked. Even though you can't see it, you can select the cold.tif image by clicking in the area where it is placed.)

8. **With both objects selected, click the Align To button in the Control panel.**

Click this button to access the Align To options.

The placed template images are stacked on top of each other in the order you placed them.

9. **Choose Align to Key Object in the menu.**

The Align and Distribute options in the Control panel are the same as the options in the Align panel.

The default key object is identified with a heavy border.

10. **Click the selected rounded rectangle on the artboard.**

    Key Object alignment allows you to define where you want other objects to align. By selecting the key object, you're telling Illustrator which object to use as the basis for alignment.

Click any object to define the key object for the alignment.

The border color matches the defined layer color.

11. **Click the Horizontal Align Center and Vertical Align Center buttons in the Control panel.**

    Because you selected the rounded rectangle as the key object, the placed template image moves to the horizontal and vertical center of the rounded rectangle; the rectangle — the key object — remains in the same place.
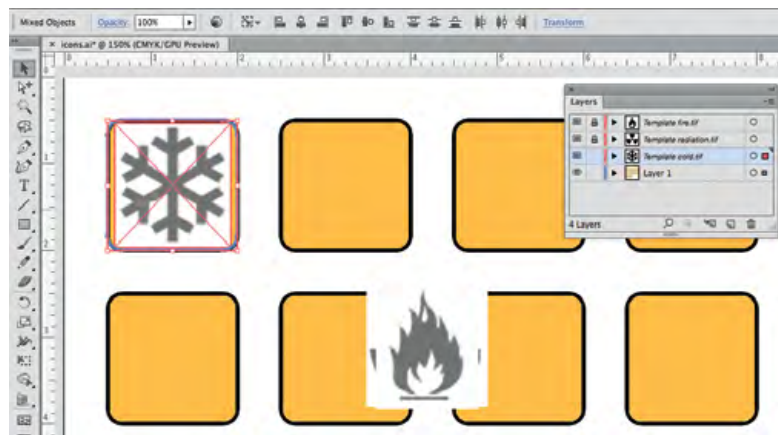
12. **In the Layers panel, click the empty space to the left of the Template cold.tif layer to relock that layer.**

    Now that the template object is in place, it's a good idea to lock it again so you don't accidentally move the object.

13. **Double-click the layer thumbnail of the Template cold.tif layer.**

    Double-clicking a layer thumbnail opens the Layer Options dialog box for that layer, where you can change a number of attributes for the selected layer.

14. **Change the Dim Images To field to 30, and then click OK to close the Layer Options dialog box.**

    Dimming the template image will make it easier to see your artwork when you draw.

15. **Repeat Steps 6–14 to position the other two template images in the first-row rectangles (as shown in the following image).**
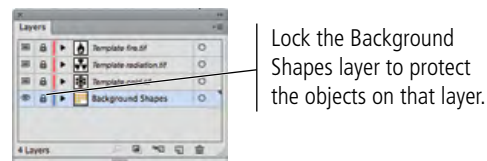

16. **In the Layers panel, double-click the Layer 1 name to highlight the name. Type Background Shapes to change the layer name, then press Return/Enter.**

    Whenever you have more than one working layer, it's a good idea to use names that tell you what is on each layer. Doing so prevents confusion later when you or someone else needs to change a particular item.

    Double-click the layer name to highlight it, so you can type a new name.

    Press Return/Enter to finalize the new layer name.

17. **In the Layers panel, click the empty space immediately left of the Background Shapes layer.**

    This step — locking the Background Shapes layer — is simply a safeguard to avoid accidentally changing the background rectangles while you're drawing the icon artwork.

    Lock the Background Shapes layer to protect the objects on that layer.

18. **In the Layers panel, click the Create New Layer button.**

In the next stage of the project, you will start tracing the object in the template. The completed icon will be a black icon on top of the rounded rectangle with the gold background color.

Create New Layer button
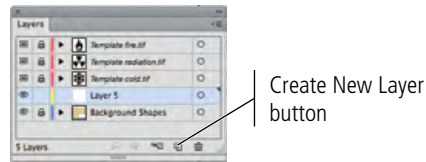
At this point, most of the gold color in the background shapes is obscured by the placed images, because the template layers are above the layer containing the rectangles. If you tried to draw the icon shapes on the existing non-template layer, you would be drawing *behind* the template — in other words, you wouldn't be able to see what you were drawing. Instead, you need a layer above the template layers, where you can create the icon artwork.
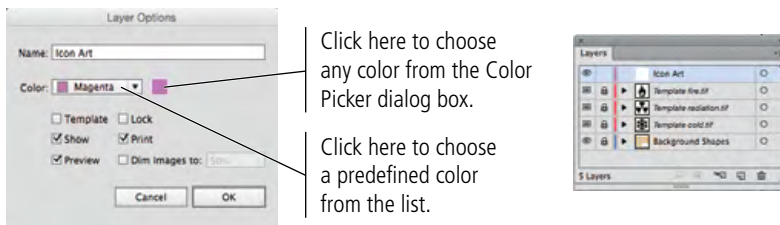
19. **In the Layers panel, drag Layer 5 to the top of the layer stack.**

New layers are automatically placed immediately above the selected layer. You need this new layer to be above the template layers so you can see what you're drawing.

20. **Double-click the Layer 5 thumbnail in the Layers panel. In the Layer Options dialog box, change the layer name to** **Icon Art** **and choose Magenta from the Color menu, then click OK.**

The Color option has nothing to do with the stroke or fill colors used in the artwork on that layer; instead, it simply determines the color of bounding box handles and other visual indicators for objects on a layer. (The default for Layer 5, Yellow, can be very difficult to see. We chose Magenta because it shows better in our screen shots.)

Click here to choose any color from the Color Picker dialog box.

Click here to choose a predefined color from the list.

21. **Save the file and continue to the next stage of the project.**

Stage 2 **Drawing Basic Shapes**

If you remember from the client meeting, the client's bitmap icons work fine on the Web, but they look terrible in print. After you redraw the icons in Illustrator, the client will be able to print them anywhere, with no loss in quality — which is the primary advantage of vector-based artwork vs. raster-based images. A number of tools and utilities can be used to create complex Illustrator artwork. Creating the icons in this project gives you an opportunity to experiment with some of these options. As you complete the other projects in this book, you will delve deeper into complex drawing techniques.

CREATE ARTWORK WITH LINES

The snowflake icon is really nothing more than a series of straight lines — which makes it ideal for introducing the Line Segment tool. In this exercise, you create simple lines, and then use some basic modification techniques to create the final icon.

1. **With `icons.ai` open, make sure the Icon Art layer is selected. Zoom in to the top-left rectangle (with the snowflake image).**

2. **In the Tools panel, select the Line Segment tool, and then click the Default Fill and Stroke button.**

Line Segment tool

Default Fill and Stroke button
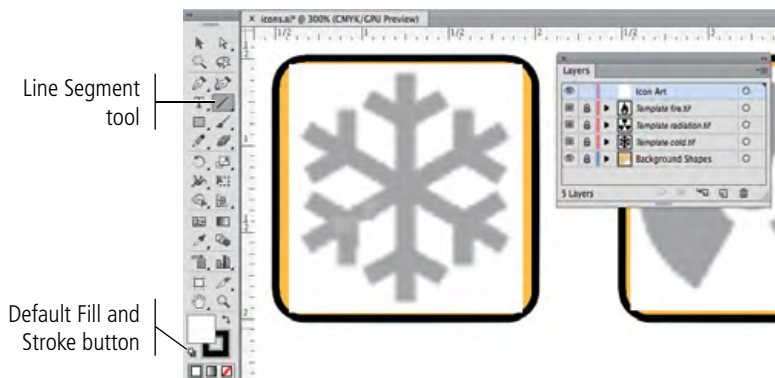
3. **Click at the bottom of the vertical line in the snowflake image, and then drag up to the top of the snowflake image. Release the mouse button while the cursor feedback shows the line at 90°.**

    As you drag, the cursor feedback shows the length and — more importantly in this case — the angle of the line you're drawing. If you don't see the cursor feedback, choose View>Smart Guides to toggle on that option.

Click here…

…and drag to here.

The 90° angle indicates that you are creating a perfectly vertical line.
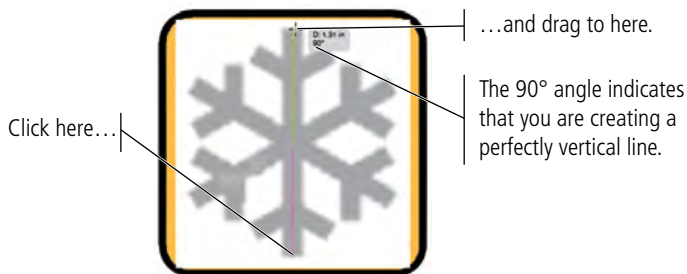
Note:

You can also press Shift to constrain a line to increments of 45°.

4. **With the Line Segment tool still active, click the cursor on the top of the left flake branch in the template image; while holding down the mouse button, drag down and right until you see the word "path" appear near the cursor, then release the mouse button.**

The word "path" is another function of Illustrator's Smart Guides; when you drag near an existing path, Illustrator identifies the path so you can place a point exactly on top of the existing path.

Click here and hold down the mouse button…

…drag to here, and then release the mouse button.

The word "path" is a function of Smart Guides.
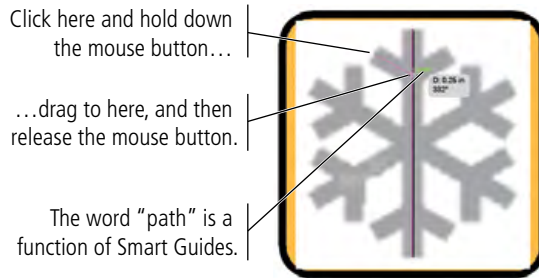
5. **Move the cursor to the top of the right flake branch until you see a green line connecting to the top of the left branch that you drew in Step 4.**

6. **Click and hold the mouse button, drag down and left until the word "anchor" appears next to the cursor, and then release the mouse button.**

The "anchor" label indicates that you have dragged to the position of an existing anchor point (in this case, the endpoint of the left flake branch). As you can see, Illustrator makes it easy to create precise lines and shapes in relation to other objects on the page.

The Smart Guide identifies the top edge of the left branch.

Click here…

…drag to here, and then release the mouse button.
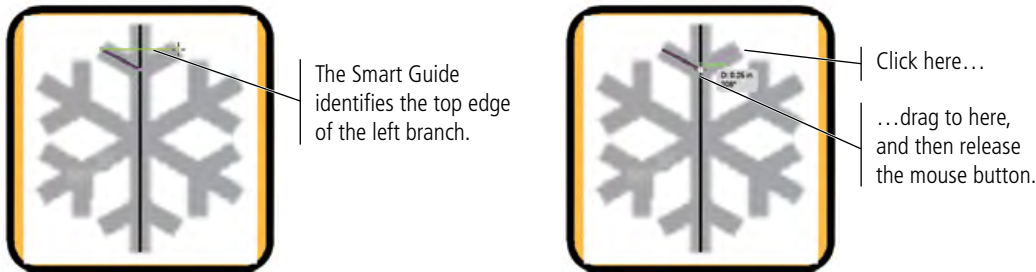
7. **Choose the Selection tool from the Tools panel, and then click the vertical line that you drew in Step 3. Choose Object>Lock>Selection.**

When an object is locked, you can't select or change it — just as locking a template layer protects the template object from being moved. In the next few steps, you select and join the endpoints of the two angled lines, which is much easier if the vertical line can't be selected (you want the vertical line to remain unchanged).
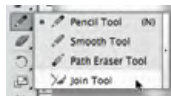
This line is selected, so it will be locked.
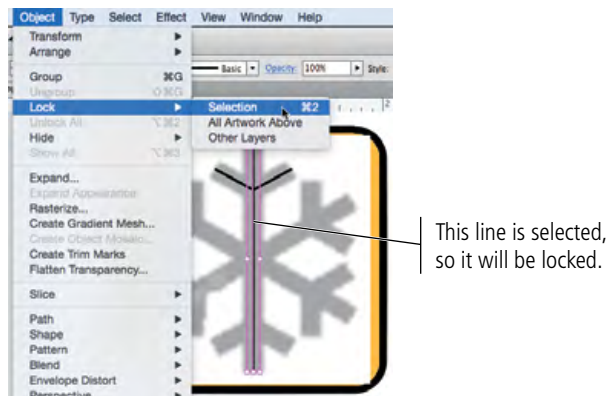
8. **Zoom in to the diagonal lines you drew in the previous steps.**

9. **In the Layers panel, click the arrow to the left of the Icon Art layer name to expand the layer.**

When you expand a layer in the panel, you can see each object that exists on that layer (called **sublayers**). You drew three line segments (paths) in this exercise; the expanded Icon Art layer lists each of those objects separately.

Objects are listed in the order you created them; the first object you create appears at the bottom of the list and the last object appears at the top. This bottom-to-top arrangement is called **stacking order**.

Click the arrow to expand the layer.

Each item on the layer is listed separately.

The vertical path is locked from Step 7.
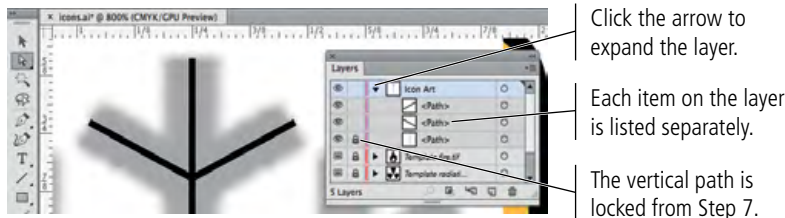
10. **Choose the Join tool in the Tools panel (nested under the Pencil tool).**

11. **Click and drag with the Join tool to paint an area over the point where the two line segments meet.**

The Join tool is an easy way to connect open line segments.

Paint over the open endpoints to join them.

Joining the endpoints combines the two separate paths into a single path with multiple segments.
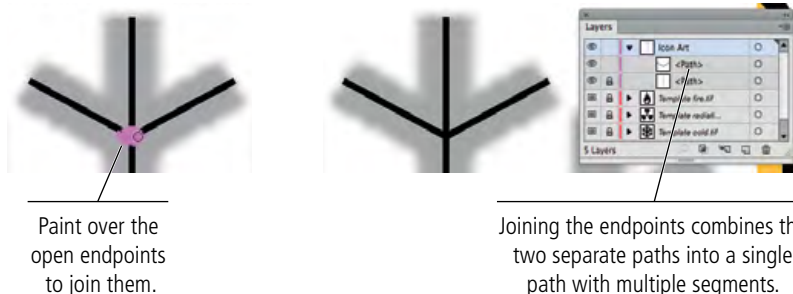
The Join tool works even when the line's endpoints do not overlap — simply paint from one endpoint to another. If lines overlap and the endpoints do not connect, you can paint to remove extra line segments past where the lines overlap.

12. **In the Layers panel, click the Lock icon for the lower path object to unlock that object.**

The Object>Unlock All menu command unlocks all individually locked objects on unlocked layers (it does not affect objects on locked layers). When a layer is expanded, however, you can use the Lock column in the Layers panel to lock and unlock individual objects without unlocking everything.

Use this column to lock or unlock specific objects on a layer.
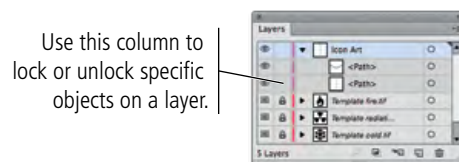
13. **Save the file and continue to the next exercise.**

Note:

You can also select open endpoints with the Direct Selection tool and choose Object>Path>Join. If the selected points overlap, as in this exercise, the two points are simply combined into a single corner endpoint. If the selected endpoints do not overlap, this command creates a straight connecting segment between the points.

Illustrator includes four important transformation tools — Rotate, Reflect, Scale, and Shear. Each of these transformations can be applied by hand using the related tool in the Tools panel, as well as numerically using the appropriate dialog box from the Object>Transform menu.

Much of the work you do in Illustrator requires changing objects that already exist. In this exercise, you use reflection to create additional sections of the snowflake icon.

1. **With icons.ai open, choose the Selection tool in the Tools panel.**

2. **Click to select the angled-branch object is selected on the artboard.**

   You can now see the bounding box of the selected object — both angled lines, which have been joined into a single object.

Connecting the points converted the two paths into a single object.
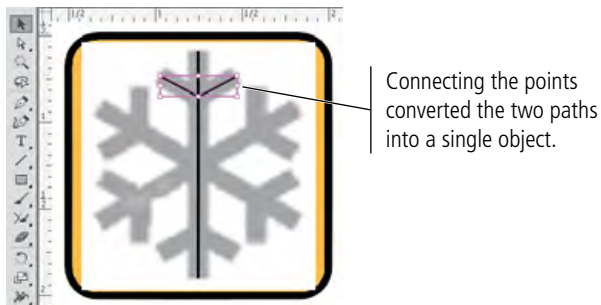
3. **Choose Object>Transform>Reflect.**

   You can reflect objects around the vertical or horizontal axis at specific degrees. In this case, you want to make the branches at the bottom of the snowflake, so you need to reflect the object around the horizontal axis.

4. **In the Reflect dialog box, make sure the Preview check box is active.**

   The Preview option, which is available in all of the Illustrator transformation dialog boxes, allows you to see the effects of your changes before you commit them.

5. **Choose the Horizontal option in the Axis section of the dialog box.**

   Reflecting on the horizontal axis flips the object top over bottom. Reflecting around the vertical axis flips the object left to right.


When Preview is checked, you can see the result of clicking OK.
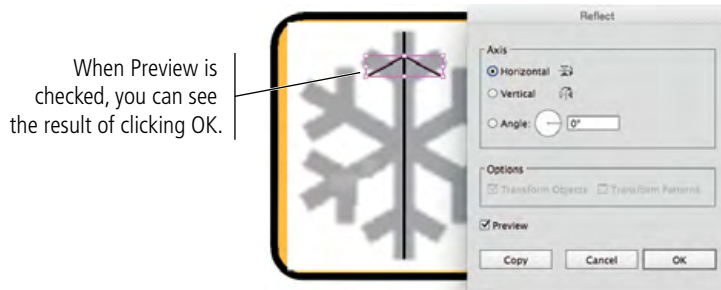
6. **Click Copy.**

If you click OK in any of the transformation dialog boxes, the transformation directly affects the selected object. Because you want another branch for the bottom of the flake, you are using the Copy function instead of simply clicking OK.

The original object remains in position.

The Copy option reflects the new object.
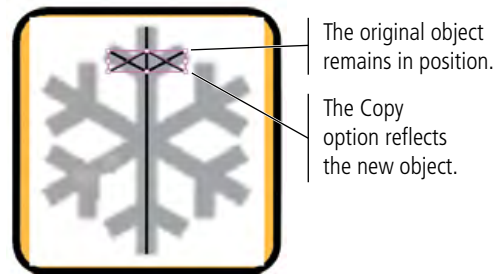
6. **With the Selection tool still active, click the reflected branches and drag them to the bottom of the flake. Place the object appropriately, using the template image as a guide.**

Again, the Smart Guides help you place the object; the green line and cursor feedback show the angle at which you're moving the selected object, so you can more easily maintain the same horizontal position.

Use cursor feedback to move the shape to the exact horizontal position (dX = 0).
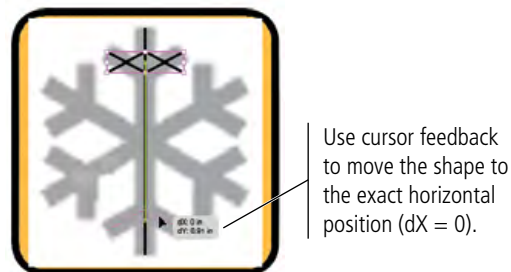
7. **Choose Select>All.**

All three objects — the vertical line and the two branch objects — are now selected.

8. **In the Control panel, change the stroke width to 7 pt.**

9. **Choose Object>Group.**

Because these three objects are basically a single entity in the icon, it's a good idea to treat them as a single object.

10. **Save the file and continue to the next exercise.**

ROTATE DRAWING OBJECTS

Very few projects are entirely horizontal, making rotating objects a foundational Illustrator skill. In this exercise, you use several rotation techniques to create the rest of the snowflake artwork.

1. **With `icons.ai` open, make sure the grouped object is selected.**

2. **Activate the Rotate tool in the Tools panel.**

   When you select the Rotate tool, an **origin point** appears by default at the center of the selected object. This origin point is the point around which rotation occurs. If you want to rotate an object around some other point, you can single-click anywhere to define a different origin point.
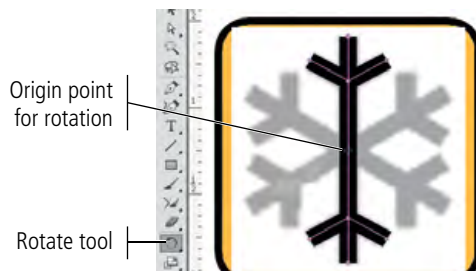
   Origin point for rotation

   Rotate tool

3. **Click near the top of the vertical line, hold down the mouse button, and then drag left and down until the line appears over the next branch in the snowflake. Note the angle in the cursor feedback, and then release the mouse button.**
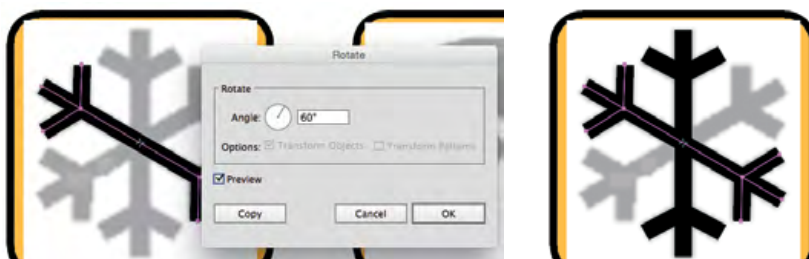
   As you can see, the rotation moved the selected objects around the origin point. Unfortunately, the vertical line is no longer there because you just rotated it.

   When you drag with the Rotate tool, the cursor feedback shows the angle of rotation.

   When you release the mouse button, the original object rotates.
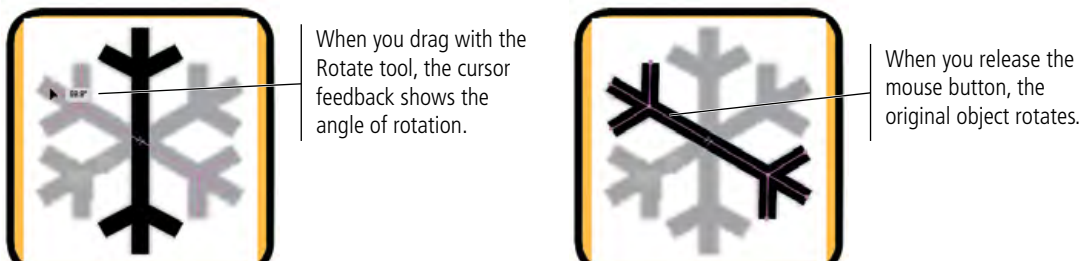
4. **Press Command/Control-Z to undo the rotation.**

5. **With the group still selected, double-click the Rotate tool to open the Rotate dialog box.**

   This dialog box is the same one you would see by choosing Object>Transform>Rotate. Transformation dialog boxes, which default to the last-used settings for that transformation, make it easy to apply very specific numeric transformations to selected objects.

6. **Type 60 in the Rotate field, and then click Copy.**

7. **Choose Object>Transform>Transform Again to create the third branch of the snowflake icon.**

As before, the Transform Again command repeats the last-used transformation — in this case, the copy-rotate transformation from Step 6.

The Transform Again command applies the last-used transformation of any type to a selected object without opening a dialog box. This command might result in movement, rotation, reflection, shear, or scale, depending on the last transformation you applied.

8. **Choose Select>All. Using the Align or Control panel, click the Vertical Align Center and Horizontal Align Center buttons.**

This step might not cause a noticeable change, depending on how precisely you created the various elements, but it's a good idea to be certain that the groups align properly.


Vertical Align Center
Horizontal Align Center
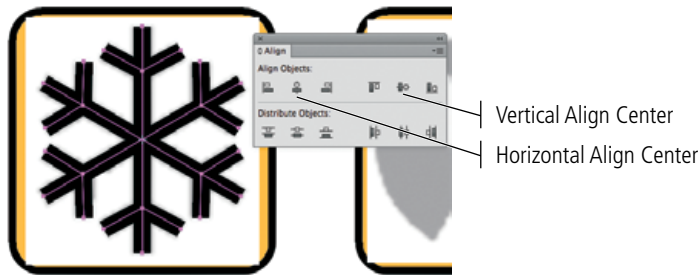
9. **With all snowflake objects selected, choose Object>Group.**

The three individual objects are components of a single thing — the "cold" icon; grouping them allows all the pieces to be treated as a single object on the artboard.

Grouping the three branches allows you to treat the icon artwork as a single object.
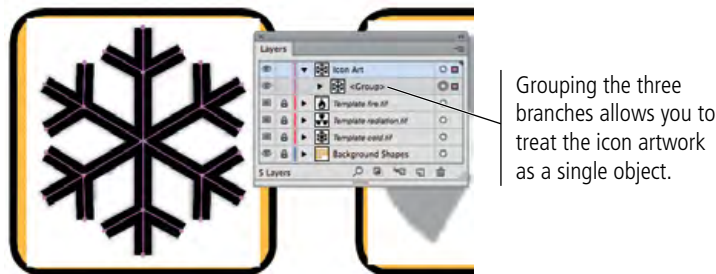
10. **With the group selected, choose Object>Lock>Selection.**

The lock icon in the Layers panel shows that the group is locked, but the parent Icon Art layer is not. You can draw more artwork on the same layer without accidentally affecting the existing artwork.

Click this space to lock or unlock only a specific object.
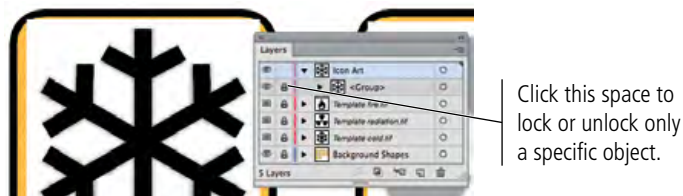
11. **In the Layers panel, select the Template cold.tif layer and click the Delete Selection button at the bottom of the panel. Click Yes in the confirmation message.**

Since the snowflake drawing is complete, you no longer need the template image.

Click here to delete the selected layer.

12. **Save the file and continue to the next exercise.**

DIVIDE BASIC SHAPES INTO COMPONENT PIECES

Using the Illustrator Pathfinder panel, you can combine multiple shapes in a variety of ways, or you can use one object as a "cookie cutter" to remove or separate one shape from another. As you work with more complicated artwork in Illustrator, you will find many different ways to use the Pathfinder functions, either alone or in combination.

1. **With icons.ai open, make sure the Icon Art layer is selected in the Layers panel. Zoom into the second rectangle in the first row of background shapes.**

2. **Select the Ellipse tool (nested under the Rounded Rectangle tool) in the Tools panel. Set the fill color to black and the stroke color to None.**

We used the Control panel to set the Fill and Stroke colors.

The Icon Art layer is selected (active).

Ellipse tool
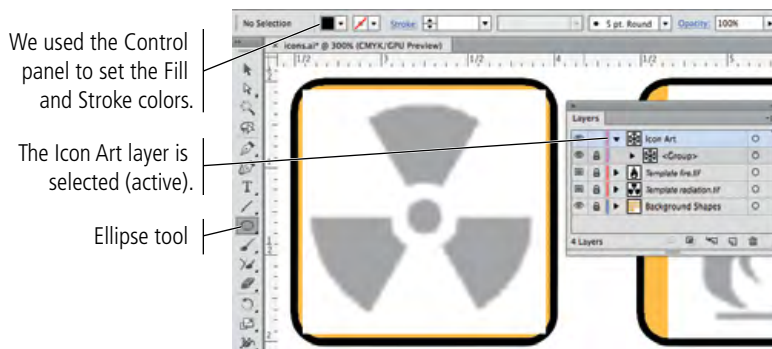
3. **Click in the center of the radiation icon, press Option/Alt-Shift, and then drag to create a circle that covers the entire template icon.**

Remember, pressing Option/Alt allows you to draw a shape from the center out. Pressing Shift constrains the shape to equal height and width. (The fill color does not appear until you release the mouse button.)

Click here, press Option/Alt-Shift…

…and drag out to create a circle that matches the outer edge of the template image.

The fill color appears when you release the mouse button.
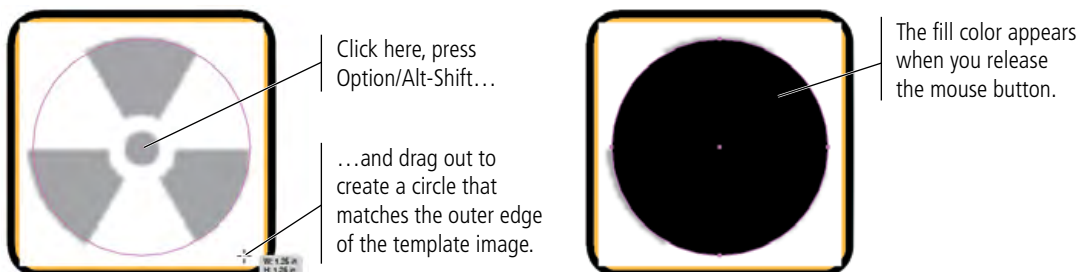
4. **With the new circle selected, change the Opacity field in the Control panel to 50.**

   Opacity defines the transparency of the selected object. In this case, you're reducing the opacity from 100% (entirely solid or opaque) so you can see the template image behind the circle you just drew.
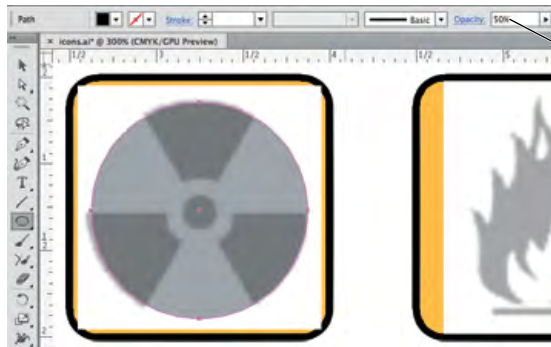
   Change the shape's Opacity value so you can see the underlying template image.

5. **Using the Ellipse tool, click again in the center of the template image, press Option/Alt-Shift, and drag to create the smaller circle in the center of the shape.**
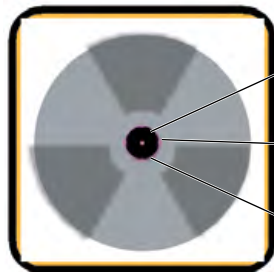
   By default, the Opacity value resets to 100% for new objects.

   The Fill and Stroke values remember the last-used settings.

   The second circle has a black fill, no stroke, and 100% opacity.

6. **With the smaller circle selected, change the fill color to None and the stroke color to white. Change the stroke weight to 5 pt.**
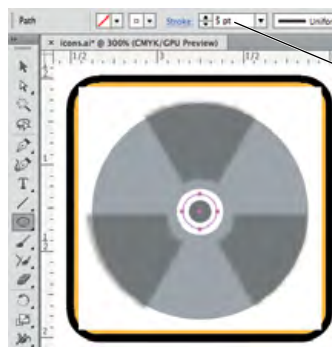
   We used the Control panel to change the Fill and Stroke attributes for the selected object.

7. **Open the Stroke panel (Window>Stroke). If you only see the Stroke Weight field, open the panel's Options menu and choose Show Options.**

   Because you used the template image to draw the small circle shape, the default position of the path does not accomplish the goal of creating the white ring. You can use the Stroke panel options to change the position of the stroke relative to the path, which better meets your needs in this artwork.

   Click here to open the panel Options menu.

8. **With the small circle selected, click the Align Stroke to Outside button in the Stroke panel.**

All 5 pt of the stroke weight moves outside the object path.

Align Stroke to Outside
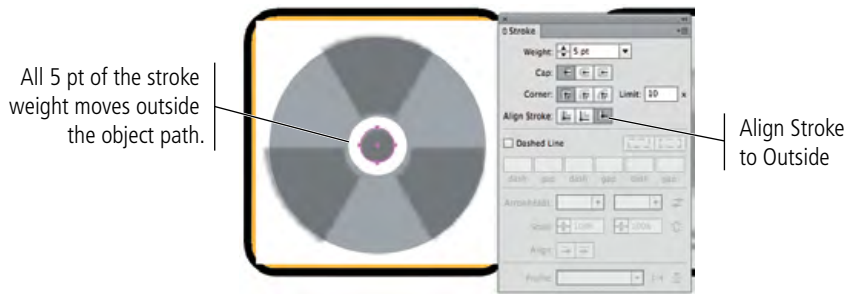
9. **Press and hold Command/Control to temporarily access the Selection tool, and click away from the existing shapes to deselect them.**

   If you don't deselect the circle, changing the Fill and Stroke attributes in the next step will change the attributes of the selected shape.

10. **Choose the Line Segment tool in the Tools panel, and then click the Default Fill and Stroke button at the bottom of the Tools panel.**

The Stroke Panel in Depth

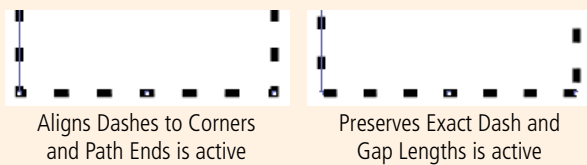The **Cap** options define the appearance of a stroke beyond the endpoint of the line.

None end cap style

Round end cap style

Square end cap style

The **Corner** options define the appearance of corners where two lines meet. When Miter Join is selected, you can define a miter limit in the Limit field. A miter limit controls when the corner switches from a pointed joint to a beveled joint, as a factor of the stroke weight. If you define a miter limit of 2 for a 2-point line, the corner is beveled if the pointed corner extends beyond 4 points (2 × 2).

Miter join   Rounded join   Beveled join

The **Align Stroke** options determine where the stroke is placed relative to the actual path.

Align Stroke to Center

Align Stroke to Inside

Align Stroke to Outside
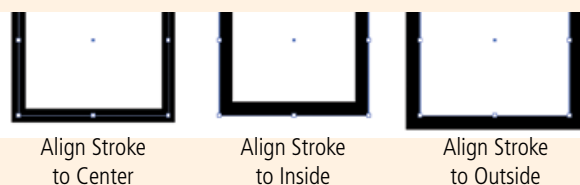
When the **Dashed Line** option is checked, you can define a specific pattern of dashes and gaps in the related fields. The two buttons to the right of the check box determine how a dash pattern is stretched (or not) so that line ends or object corners have the same appearance.

Aligns Dashes to Corners and Path Ends is active

Preserves Exact Dash and Gap Lengths is active

The **Arrowheads** options can be used to control end treatments on each end of a line. You can choose an arrowhead shape from the menus, and change the scale of applied arrowheads (relative to the applied stroke weight).
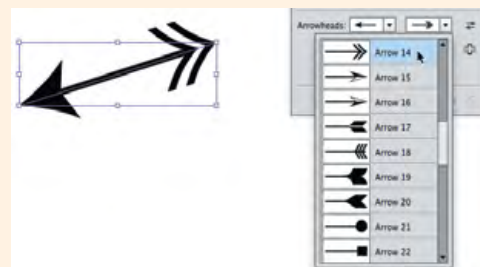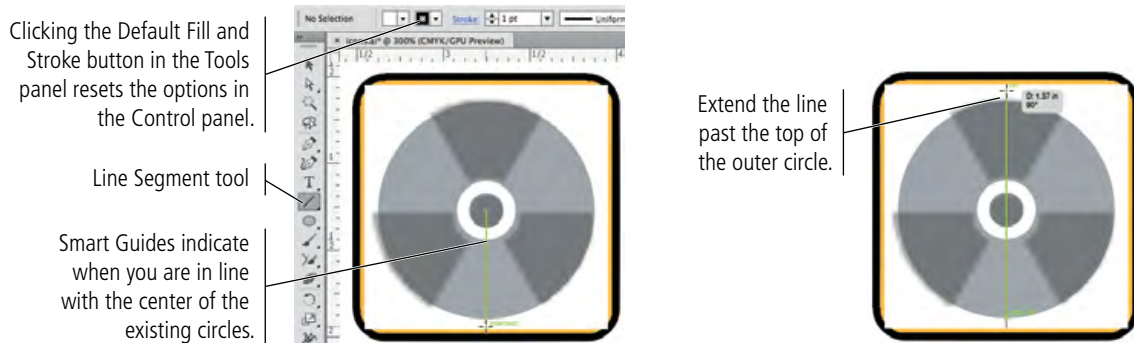
The Align [Arrowheads] options determine how arrowhead treatments are positioned relative to the path endpoint.

Place Arrow Tip at End of Path

Extend Arrow Tip Beyond End of Path

11. **Move the cursor below the circles you created until you see the Smart Guide connecting to the existing shapes' center points. Click and drag up to create a vertical line that extends past the top edge of the outer circle.**

Although none of the icon wedges have a vertical line, it's easier to start at vertical and rotate the objects as necessary.

To create the vertical line, use the cursor feedback to drag a 90° line, or press Shift to constrain the line to 90°.

Clicking the Default Fill and Stroke button in the Tools panel resets the options in the Control panel.

Line Segment tool

Smart Guides indicate when you are in line with the center of the existing circles.

Extend the line past the top of the outer circle.

12. **Using the Selection tool, draw a marquee around the three objects that you have created to select them all. Use the options in the Align or Control panel to align the selected objects horizontally and vertically.**

13. **Click away from the selected objects, and then select only the vertical line.**

The icon has six wedges, which means each half of the circle needs to be divided into three pieces. You will use precise rotation to slice the larger circle into the necessary parts.

14. **With the vertical line selected, choose Object>Transform>Rotate. Type 60 in the Angle field and click Copy.**

This menu command has the same result as double-clicking the Rotate tool, but you don't have to switch tools.

A full circle has 360 degrees. You're cutting the circle into six equal pieces; one sixth of 360° is 60°, so this is the exact angle that you need to create the correct number of pieces.
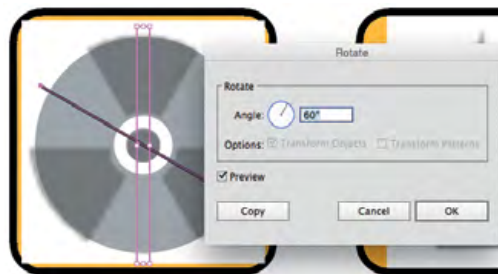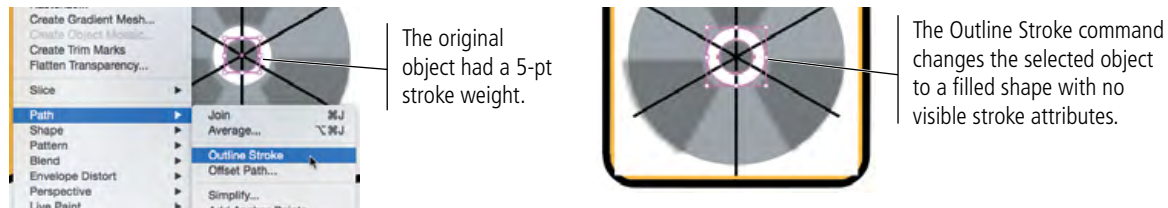
15. **Choose Object>Transform>Transform Again to make a third line.**

The Transform Again command applies the last-used transformation of any type to a selected object without opening a dialog box. Because you used the Rotate dialog box with the Copy button in the previous step, the Transform Again command copies the current selection and rotates it by the same angle you used in Step 14.
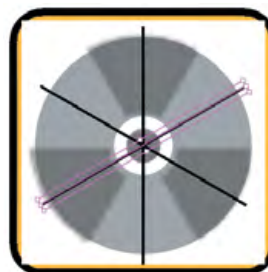
16. **Using the Selection tool, select the smaller circle only and choose Object>Path>Outline Stroke.**

    This command changes the object stroke to a filled object. You drew the white circle to "cut out" the smaller black circle from the wedges. The Pathfinder functions recognize strokes for cutting apart shapes, but the stroke weight is not considered when the new paths are generated. To create the thick white space in the actual icon, you need to convert the heavy stroke to a filled shape.
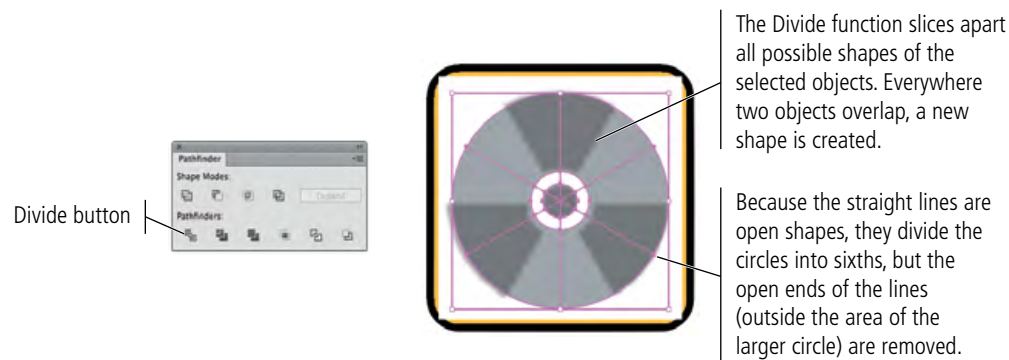

The original object had a 5-pt stroke weight.

The Outline Stroke command changes the selected object to a filled shape with no visible stroke attributes.

17. **Select all the objects in the icon, and then open the Pathfinder panel (Window>Pathfinder).**

    You can choose Select>All, press Command/Control-A, or drag a marquee with the Selection tool to select all unlocked objects on the artboard. Because you locked the snowflake artwork in the first icon, those objects are not selected.

18. **In the Pathfinder panel, click the Divide button.**

    Options in the Pathfinder panel allow you to cut shapes out of other shapes and merge multiple shapes into a single shape.

    It's important to realize that many Pathfinder options can be applied in more than one way. We're using the Divide and Unite options in this exercise to give you an idea of what you can accomplish with the Pathfinder.


Divide button

The Divide function slices apart all possible shapes of the selected objects. Everywhere two objects overlap, a new shape is created.

Because the straight lines are open shapes, they divide the circles into sixths, but the open ends of the lines (outside the area of the larger circle) are removed.

19. **Save the file and continue to the next exercise.**

The Pathfinder Panel in Depth

In the Pathfinder panel, the top row of buttons — the Shape Modes — create complex shapes by combining the originally selected shapes. (You can press Option/Alt and click a Shape Mode to maintain the paths from the original objects.)
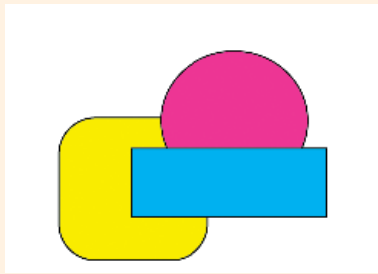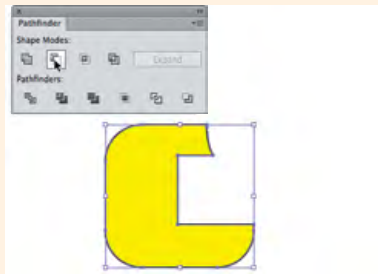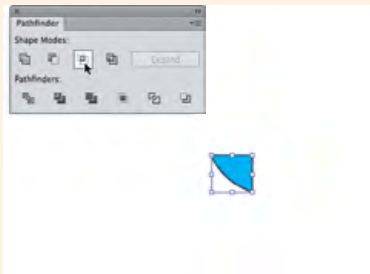
Original objects
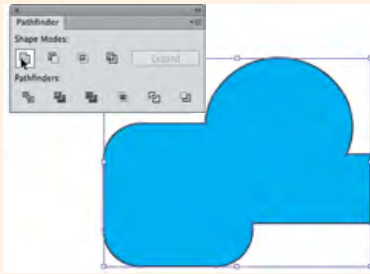
Unite combines all selected objects into a single shape. By default, the Shape options result in a single new object.
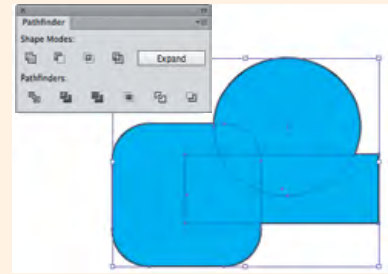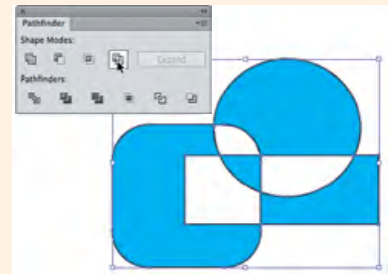
If you Option/Alt-click a shape mode button, the result maintains the original paths unless you manually expand it.

Minus Front removes overlapping areas from the backmost shape in the selection.

Intersect creates a shape of only areas where all selected objects overlap.
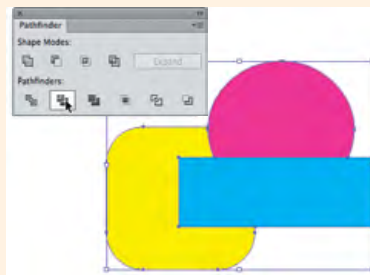
**Exclude** removes any areas where two objects overlap.

The second row of options — the Pathfinders — do exactly that. The resulting shapes are some combination of the paths that made up the originally selected objects.
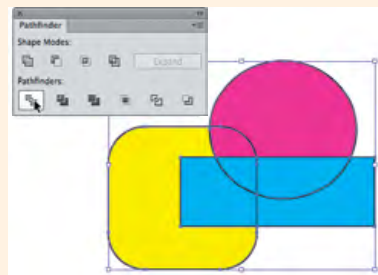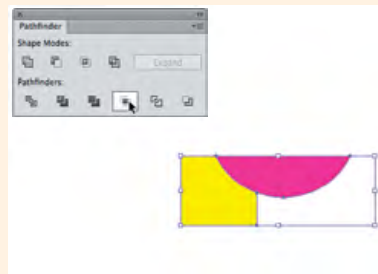
**Divide** creates separate shapes from all overlapping areas of selected objects.

Trim removes underlying areas of overlapping objects. Objects of the same fill color are not combined.
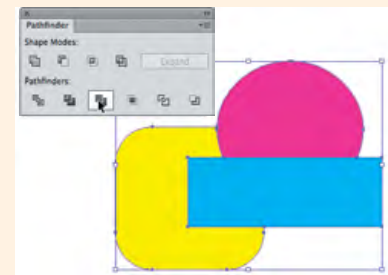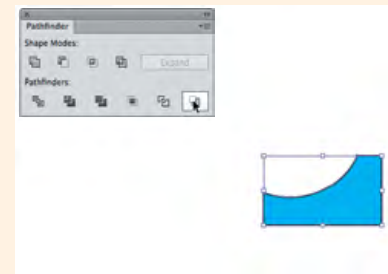
Merge removes underlying areas of overlapping objects. Objects of the same fill color are combined.

Crop returns the areas of underlying objects that are within the boundary of the topmost object.
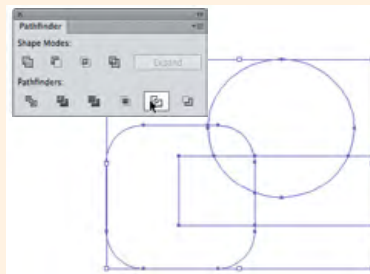
Outline divides the selected objects, then returns unfilled, open paths.

Minus Back removes the area of underlying objects from the front object.
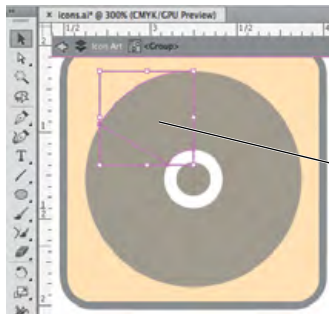
✍ WORK IN ISOLATION MODE

Groups can be invaluable when you need to treat multiple items as a single object. When items are grouped, it is easy to move and manipulate the entire group as a single object. In many cases, however, you will need to make changes to only part of a group. Depending on the complexity of the file, this can be very difficult without first breaking apart the group ("ungrouping"). Illustrator's Isolation mode offers a convenient work-space, where you can work with grouped objects as if they were stand-alone objects.

1. **With `icons.ai` open, hide the Template radiation.tif layer.**

2. **Use the Selection tool to double-click any of the shapes in the radiation icon to enter Isolation mode.**

   When you use the Pathfinder panel, the resulting shapes are automatically grouped. Because all of these shapes make up the icon artwork, it's a good idea to leave them grouped. Isolation mode allows you to work with the constituent objects without ungrouping.

3. **Using the Selection tool, click the outer wedge shape in the top-left area of the icon, and then press Delete.**

   Because you're working in Isolation mode, you can use the Selection tool to select one object, even though the object is part of a group on the main artboard.
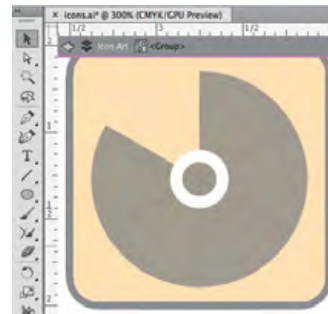
4. **Select and delete every other wedge in the outside area of the group.**

5. **Choose View>Outline.**

   Outline mode allows you to see and work with the basic shapes only; object fills don't obscure the shapes that you need to see clearly.

6. **Click in the center set of wedges and drag a marquee that encompasses the center points of all six center wedges.**

   If you tried to do this in Preview mode, clicking one of the filled shapes and dragging would actually move the shape you clicked. Because the fills are not technically present in Outline mode, you can use the click-drag method to select all six shapes instead of Shift-clicking each one individually.

   Be sure you don't click on any actual line when you begin to draw the selection marquee. If necessary, zoom in so you can clearly see the empty spaces in the small wedge shapes.
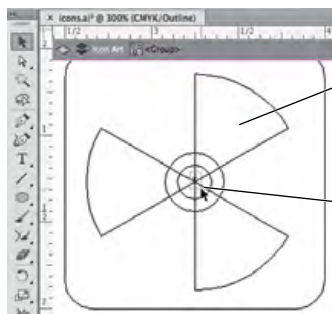
   In Outline mode, you can't see or interact with the objects' Fill attributes.

   Because you can't select an object's fill, you can drag a selection marquee to select only the six small shapes in the icon center.
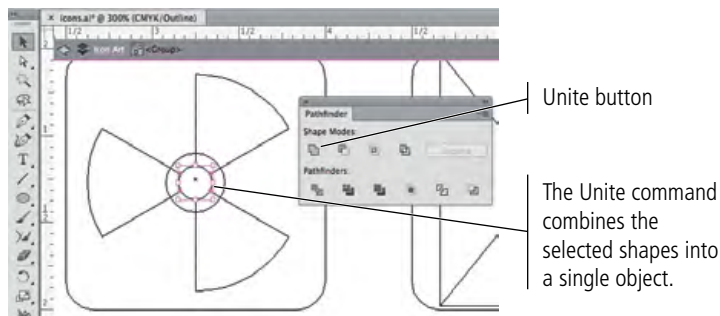
7. **In the Pathfinder panel, click the Unite button.**

This function merges the selected shapes into a single object.

Unite button

The Unite command combines the selected shapes into a single object.

8. **Choose View>GPU Preview or View>Preview to exit Outline mode and display the normal artwork.**

The available menu options depend on whether GPU Performance is enabled on your device.

- If GPU Performance is enabled, you can use the View menu to toggle between the Outline and GPU Preview mode. A separate menu option allows you to choose Preview on CPU, which does not use the GPU to display graphics.

- If GPU Performance is not enabled, you can toggle between Outline and regular Preview mode.

Working with GPU Preview

The Graphics Processing Unit (GPU) is a specialized processor that can quickly execute commands for displaying images, which allows faster artwork rendering in Illustrator.

If your computer meets the hardware and software requirements*, GPU Performance is enabled by default. You can temporarily disable Illustrator's GPU Preview mode by choosing View>Preview on CPU. You can also permanently disable the feature in the GPU Performance pane of the Preferences dialog box. (Clicking the GPU Performance button in the Application/Menu bar opens this pane.)
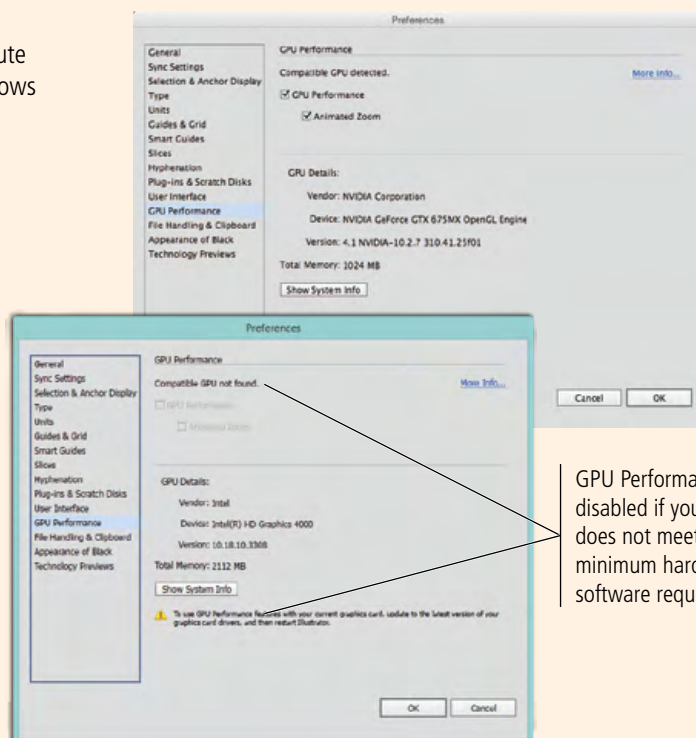
GPU Performance button
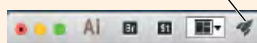
When GPU Performance is enabled and the Zoom tool is active, you can also use the animated zoom feature:

- Hold down the mouse button to dynamically zoom in on the spot where you click.
- Click and drag right to dynamically zoom in.
- Click and drag left to dynamically zoom out.

*A complete list of requirements can be found at https://helpx.adobe.com/illustrator/kb/gpu-performance-preview-improvements.html

GPU Performance is disabled if your system does not meet the minimum hardware and software requirements.

9. **Using the Selection tool, click the fill of one of the white shapes to select it, then choose Select>Same>Fill Color.**
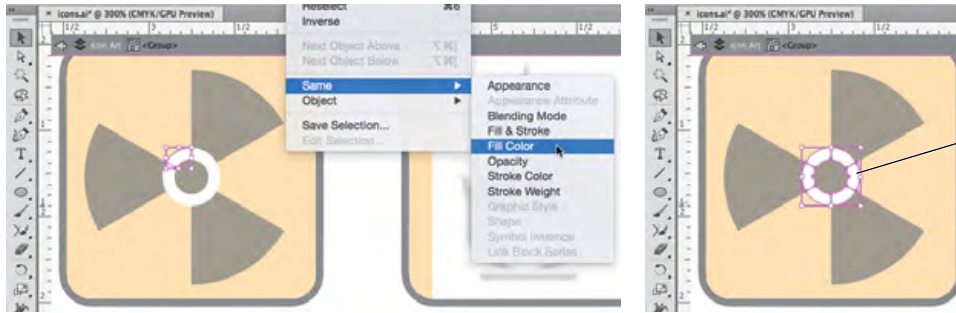
All six white-filled objects are selected because the original selection had a white fill.

10. **With all six white shapes in the icon selected, press Delete.**

11. **Using the Selection tool, click to select any one of the black (partially transparent) objects, then choose Select>Same>Opacity.**

The options in this menu are very useful for finding objects that share specific attributes. Be careful, however, when you use the Select Similar functions. They select all similar unlocked objects on the entire artboard; if the art for another unlocked icon had a white fill, for example, it would also be selected.

12. **Change the Opacity (in the Control panel) to 100 for the selected objects.**
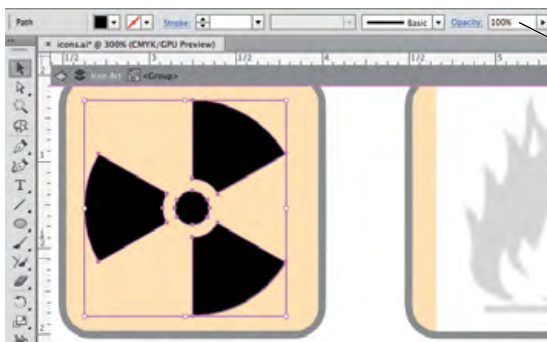
Use this field to restore the artwork to 100% opacity.
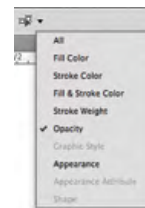
13. **At the top of the document window, click the arrow button twice to return to the main artboard.**

Your icon is almost complete; you only need to rotate the shape to match the image.

14. **Save the file and continue to the next exercise.**

USE MEASUREMENTS TO ADJUST YOUR ARTWORK

Depending on the type of work you do, Illustrator drawings can be entirely freeform, precisely measured, or a combination of the two (as in this case). 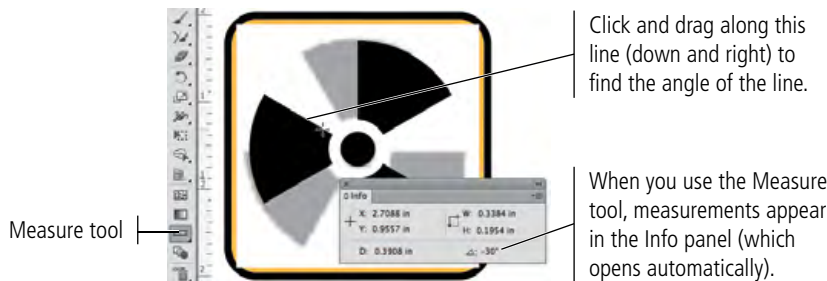The Measure tool evaluates different dimensional attributes of objects on the page. As you might expect from the name, the Measure tool acts like a digital tape measure. In addition to sizes and positions, the tool also measures angles — an important feature for technical drawing that requires precise detail.

1. **With `icons.ai` open, show the Template radiation.tif layer.**

2. **Choose the Measure tool in the Tools panel (under the Eyedropper tool).**

3. **Click at the outside corner of the left wedge, and then drag down and right along the shape edge (as shown in the following image).**

Measure tool

Click and drag along this line (down and right) to find the angle of the line.

When you use the Measure tool, measurements appear in the Info panel (which opens automatically).

The Measure tool tells you that the angle of this line is –30°. You need it to be 180° (horizontal), which means you need to rotate the shape by 30°.

4. **Select the group with the Selection tool, and then choose Object>Transform>Rotate.**

5. **Change the Angle field to 30 and click OK.**
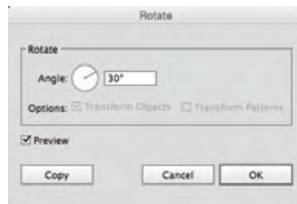
6. **In the Layers panel, delete the Template radiation.tif layer.**

7. **Lock the radiation artwork group.**

   You can use the Layers panel lock icon, or choose Object>Lock>Selection. This step protects the completed icon artwork from inadvertently being changed while you work on the rest of this project.

8. **Save the file and continue to the next exercise.**

DRAW WITH THE PENCIL TOOL

At this point, you have used a number of basic shapes to create finished icon artwork. As you might already realize, however, not all artwork can be created from basic shapes and lines. Illustrator includes everything you need to create artwork in any form, from a basic square to irregular shapes without a single visible straight edge. The Pencil tool is one method for creating custom shapes. Like a regular pencil on a piece of paper, the Pencil tool creates lines that follow the path of your cursor. (If you have a digital drawing tablet, the Pencil tool can be particularly useful for drawing custom artwork.)

1. **With icons.ai open, make sure the Icon Art layer is selected in the Layers panel. Zoom in to the third rectangle in the first row of background shapes.**

2. **Choose the Pencil tool and click the Default Fill and Stroke button in the Tools panel.**

The Icon Art layer is selected (active).
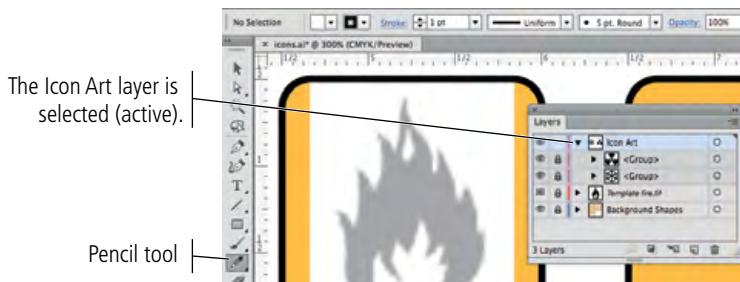
Pencil tool

3. **Double-click the Pencil tool in the Tools panel.**

Double-clicking certain tools in the Tools panel opens an Options dialog box, where you can control the behavior for the selected tool. The Pencil tool options include:

- **Fidelity.** This option determines how far apart anchor points are added as you drag. Smooth results in fewer points and smoother curves, but also less accurately matching the path you draw. More accurate means more anchor points and a path closer to what you draw, although this can make the lines appear choppy.

- **Fill New Pencil Strokes.** By default, pencil paths are not filled regardless of the fill color defined in the Tools panel.

- **Keep Selected.** If this option is checked, the line you draw is automatically selected when you release the mouse button.

- **Option Key Toggles to Smooth Tool.** As the name suggests, this allows you to quickly and temporarily switch to the Smooth tool while drawing with the Pencil tool. (The Smooth tool can be used to remove unnecessary points along a pencil-drawn path, removing small or jagged jumps in the path.)

- **Close Paths when Ends are within __ Pixels.** Prior to the 2014 release of Illustrator CC, you had to press Option/Alt to create a closed path with the Pencil tool. In the 2014 CC release, holding the modifier key was no longer necessary to create a closed path.

  In the current version, you have the choice. When the Close Paths... option is active, dragging back near the original starting point creates a closed path when you release the mouse button. If this option is not checked, dragging near the original point does not create a closed path (even with the modifier key from previous versions).

- **Edit Selected Paths.** If this option is checked, drawing near a selected path (based on the Within value) can change the existing path. This is an important distinction — especially when Keep Selected is checked — because you can accidentally edit the first path instead of creating a second shape.
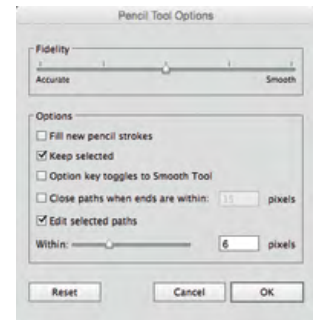
4. **Define the following settings in the Pencil Tool Options dialog box:**
   - **Set the Fidelity slider to the midpoint.**
   - **Check the Close Paths... option**
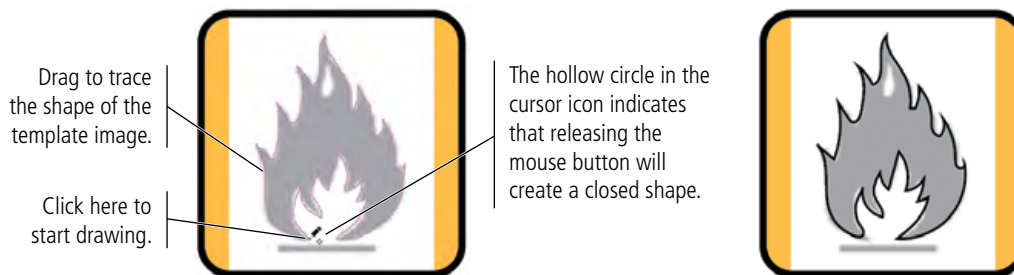   - **Uncheck all other options**

5. **Click OK to apply your changes and return to the artboard.**

6. **Click at the bottom-left point of the fire icon, hold down the mouse button, and begin dragging around the shape of the fire.**
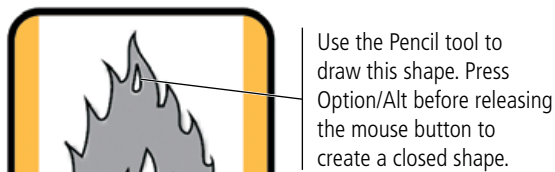
7. **When you get near your original starting point and a hollow circle appears in the cursor icon, release the mouse button.**

   As you drag, a colored line indicates the path you're drawing. Don't worry if the path isn't perfect; when you release the mouse button, Illustrator automatically smoothes the path.

   When you release the mouse button, the shape shows the defined stroke color but not the fill color because you unchecked the Fill New Pencil Strokes option in Step 4.

   Drag to trace the shape of the template image.

   Click here to start drawing.

   The hollow circle in the cursor icon indicates that releasing the mouse button will create a closed shape.

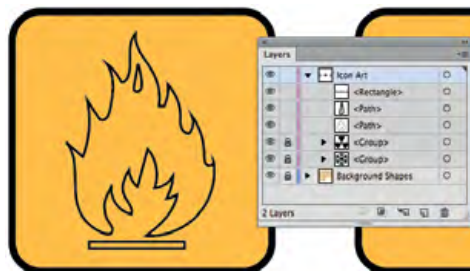8. **Click near the top point of the white flame area (inside the first path) and drag to create the white inner shape in the fire icon.**

   Use the Pencil tool to draw this shape. Press Option/Alt before releasing the mouse button to create a closed shape.

9. **Using the Rectangle tool, draw the gray bar below the fire shape.**

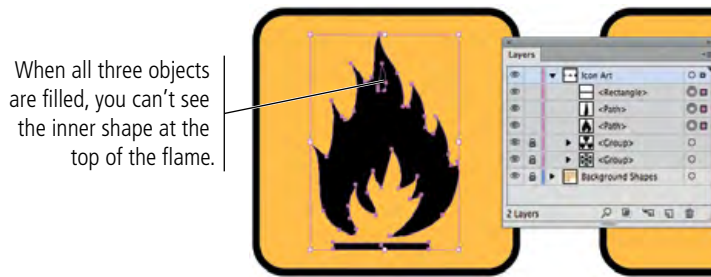10. **In the Layers panel, delete the Template fire.tif layer.**

11. **Use the Selection tool to select all three shapes of the icon art. Change the fill color to black and the stroke color to None.**

When all three objects are filled, you can't see the inner shape at the top of the flame.

12. **Choose Object>Compound Path>Make.**

A **compound path** is a single shape made up of more than one path. Compound paths usually have inner "empty" areas, such as the letter O or Q.

This option combines all three selected shapes into a single shape; the area of the smaller shape is removed from the larger shape behind it.

As a compound path, the inner shape is removed from the outer shape.

All shapes that are part of the compound path are combined into a single object.

13. **Save the file and close it.**

Project Review

fill in the blank

1. _____ are composed of mathematical descriptions of a series of lines and points; they are resolution independent, can be freely scaled, and are automatically output at the resolution of the output device.

2. _____ are pixel-based, made up of a grid of individual pixels (rasters or bits) in rows and columns.

3. The _____ is a rectangle that marks the outermost edges of an object, regardless of the actual object shape.

4. _____ is the relative top-to-botom order of objects on the artboard, or of layers in the Layers panel.

5. The _____ is used to select entire objects or groups.

6. The _____ is used to select individual paths and points of a shape, or to select component pieces within a group.

7. The _____ is used to draw freeform paths defined by dragging the mouse cursor.

8. Press _____ to temporarily access the Selection tool; releasing the modifier key restores the previously selected tool.

9. The _____ is used to create complex shapes by combining multiple selected objects.

10. A(n) _____ is a single object that is made up of more than one shape.

short answer

1. Briefly explain the difference between vector graphics and raster images.

2. Briefly explain the difference between the Selection tool and the Direct Selection tool.

3. Briefly explain the difference between Shape Mode and Pathfinder operations in the Pathfinder panel.

Use what you learned in this project to complete the following freeform exercise.
Carefully read the art director and client comments, then create your own design to meet the needs of the project.
Use the space below to sketch ideas; when finished, write a brief explanation of your reasoning behind your final design.

art director comments

The client is pleased with the first three icons, and they want you to complete the rest of the warning icons. They also want you to create an additional set of icons for travel and outdoor activities that they offer as benefits during their international corporate conferences.

To complete this project, you should:

❏ Complete the remaining international warning icons. The bitmap versions are in your WIP>Symbols folder.

❏ Carefully consider the best approach for each icon and use whichever tool (or tools) you feel is most appropriate.

❏ Create a second Illustrator file for the six new recreation icons.

client comments

We host a number of large, international conventions and conferences every year, and many attendees bring their families along for a working vacation. To keep everyone happy, we have started offering different outdoor activities for the families while their spouses are attending sessions, but the international crowd means that many people need visual help getting to the right place.

Since you did such a good job on the first three icons, we would like you to finish those. But first, we want you to create icons for horseback riding, sailing, swimming, hiking, rock climbing, and nature walks.

We don't have the images for these ones, so we would like you to come up with something. Remember, icons need to be easily recognizable, so they should very clearly convey visually what each one is for.

project justification

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The skills that you learned in this project will serve as the foundation for most work you create in Illustrator. You learned how to place raster images as templates, from which you created scalable vector graphics that will work in virtually any printed application. You learned a number of techniques for selecting objects and component pieces of objects, as well as various options for aligning objects relative to one another and to the artboard.

You learned how to draw primitive geometric shapes, and how to control the color of objects' fill and stroke attributes. You used a number of transformation options, including cloning methods to copy existing objects. Finally, you learned how to draw freeform shapes to suit more complex needs. As you move forward in this book, you will build on the basic skills you learned in this project to create increasingly complex artwork.

Create and transform basic rectangles with rounded corners

Control object fill and stroke color

Use various techniques to select objects, groups, and the component pieces of those objects and groups

Use a variety of methods to place objects relative to one another

Clone, rotate, and reflect basic lines

Use the Pathfinder to combine basic shapes into complex artwork

Use the Pencil tool and compound paths to draw complex shapes