

## 6 Steps to Creating a Good Overlapping Structure

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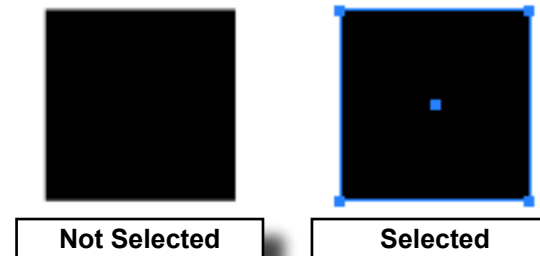
*Create overlapping structures like the one shown here in six simple steps!*

## 6 Steps to Creating a Good Overlapping Structure

### What You Need to Know...

To complete this assignment you will use the **Selection Tool**, the **Rectangle** and **Ellipse Tools**, and the **Fill and Stroke Tool**. These tools are shown in the illustration on the left.

The **Selection Tool** allows you to click on an object and select it and move it. When an object is selected it is highlighted. The illustration below shows the difference between an object that is selected and one that is not.

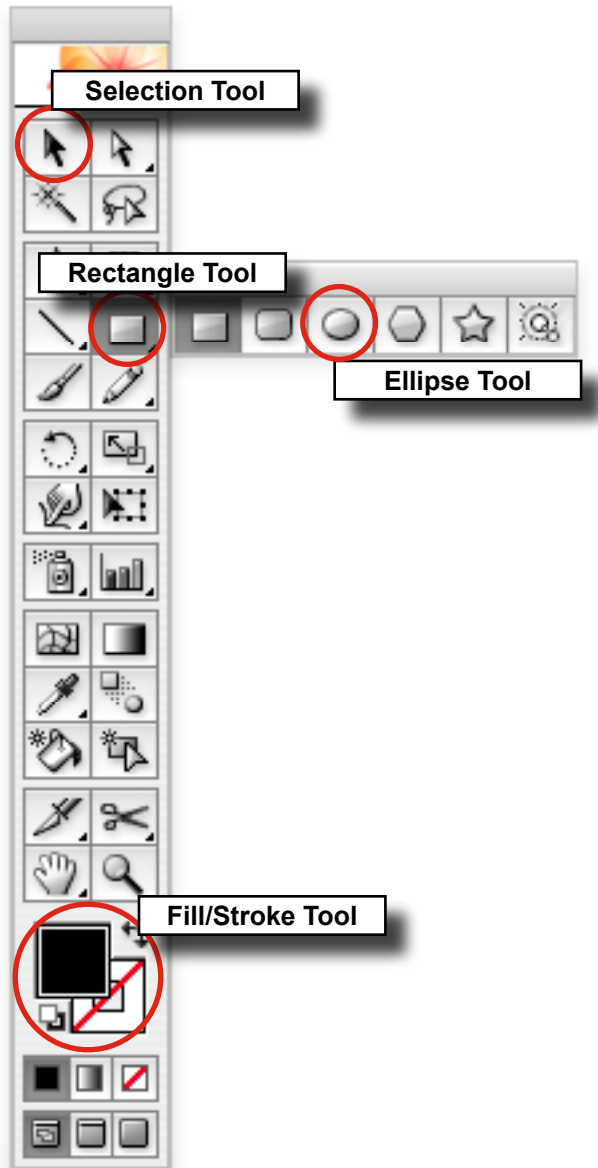
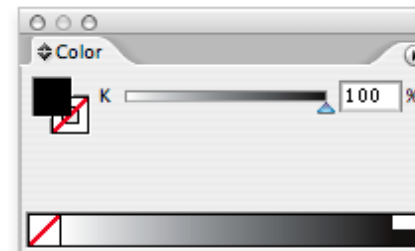


*NOTE: To change an object's size, use the **Free Transform Tool**.*



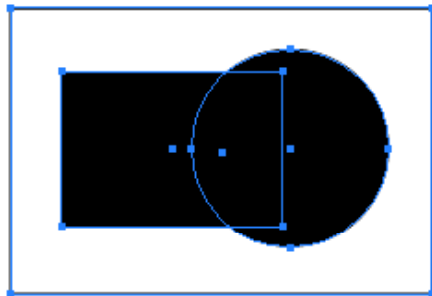
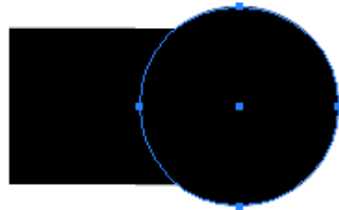
Use the **Rectangle Tool** and the **Ellipse Tool** to draw the shapes for this exercise. You will notice other shape tools as well. Any of these may be used to complete the assignment. You can access the other shapes by clicking on the Rectangle Tool and holding down the mouse key.

Use the **Fill and Stroke Tool** to change the colors on the objects. For this exercise and the assignment, you will use a black fill and no stroke. Set the colors up just as they are shown in the illustration on the left. You may also use the **Color Palette**, shown below, to change the fill and stroke. You will find this palette by going to the *Menu Bar > Window > Color*.



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### **Step 1: Draw a Rectangle**

Make sure your Fill and Stroke are set to black fill and no stroke. Using the **Rectangle Tool**, click and drag to create a rectangle as shown on the left.

### **Step 2: Draw a Circle that Overlaps the Rectangle**

Next, select the **Ellipse Tool** and click and drag to draw a circle. Holding down the shift key while you drag will “constrain” the ellipse to a perfect circle. *NOTE: Holding the shift key while using the Rectangle Tool creates a perfect square.* Make sure the rectangle and circle overlap as shown on the left. Use the **Selection Tool** if necessary to move the objects to the correct position.

### **Step 3: Draw a Container for the Two Objects**

You are now going to put the two objects in a container. This is for presentation purposes. Change the Fill and Stroke to white fill and black stroke. *NOTE: You can change the thickness of the stroke by going to the Menu Bar > Window > Stroke and changing the weight.* A 1 pt. stroke will work well for this. Using the Rectangle Tool, drag a container for the two objects. The container will be on top of the two objects at first, move it behind the two objects by selecting it and going to the *Menu Bar > Object > Arrange > Send to Back*.

### **Step 4: Group the Objects**

These two objects and their container will be used for all eight overlapping structures. For presentation purposes, they should be perfectly spaced and aligned. To do this, you will group the two objects and the container, copy the group, and paste it multiple times.

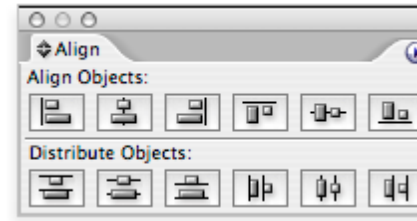
First, select the two objects and the container by holding down the **Shift Key** and using the **Selection Tool** to click on each object. The **Shift Key** allows you to select multiple objects.

Go to the *Menu Bar > Object > Group*. Now when you select one of the objects, you select all of them because they are grouped together.

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### Step 5: Copy, Paste, and Align the Group

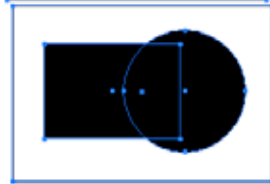
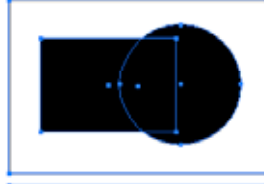
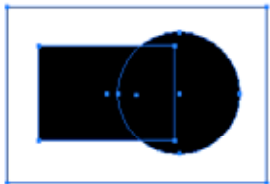
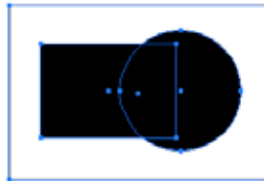
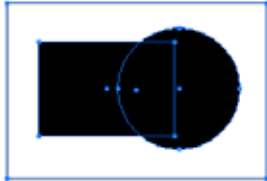
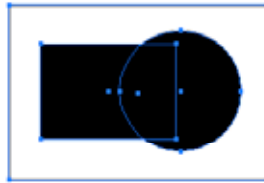
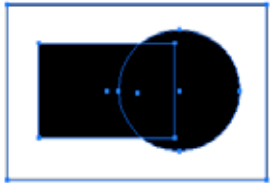
With the group selected, go to the *Menu Bar > Edit > Copy*. This makes a copy of the group. To paste it, go to the *Menu Bar > Edit > Paste*. Repeat the *Paste* command until you have FOUR total groups. Using the **Selection Tool**, move each group until they are lined up vertically. You don't have to worry about the alignment being perfect, you will use the **Alignment Palette** for that. To access the **Align Palette** go to the *Menu Bar > Window > Align*. The **Align Palette** is shown below.



Take time to mouse over each of the buttons in the **Align Palette** to see what they do. (If you rest your pointer on a button, a "tool tip" pops up that explains the function of the button.)

To align and distribute the groups, shift select all four groups. In the **Align Palette** click the *Horizontal Align Button* under *Align Objects* and click the *Vertical Distribute Center* button under *Distribute Objects*. This will align and space the four groups properly.

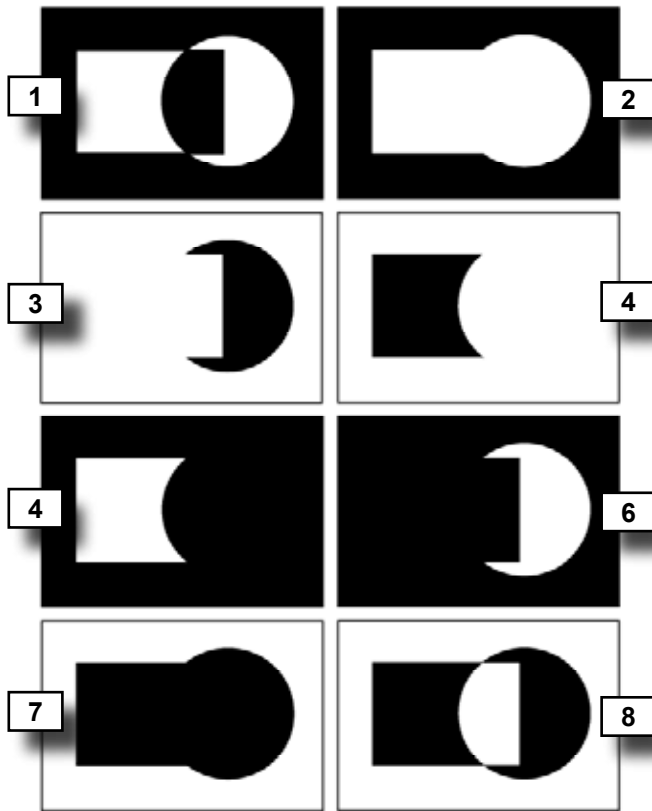
To create the other four objects, group the four you have, copy and paste the group, and use the **Align Palette** to align the two groups.



Not Aligned

Aligned

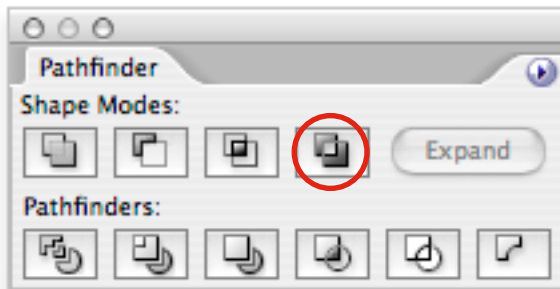
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### Step 6: Change the Colors on the Two Objects and the Containers

To create the overlapping structures as shown on the left, follow the appropriate directions below. You will have to ungroup each object in order to change the colors. To do this go to the *Menu Bar > Object > Ungroup*.

1. This is the most difficult one to do so you may want to do the others first and then come back to this one. You must use the **Pathfinder Palette** as explained in the tip below. First, change the container to have a black fill. Shift select the rectangle, circle, and container. Click the *Exclude Overlapping Shape Areas* button under *Shape Modes*.
2. Change the container to a black fill and change the rectangle and circle to a white fill.
3. Change the rectangle to a white fill and move it to the front by going to the *Menu Bar > Arrange > Bring to Front*.
4. Change the circle to a white fill and move it to the front by going to the *Menu Bar > Arrange > Bring to Front*.
5. Change the container to a black fill and the rectangle to a white fill. Move the circle to the front by going to the *Menu Bar > Arrange > Bring to Front*.
6. Change the container to a black fill and the circle to a white fill. Move the rectangle to the front by going to the *Menu Bar > Arrange > Bring to Front*.
7. This one is already done!
8. Use the **Pathfinder Palette** as explained in the tip below. Shift select the rectangle and circle and click the *Exclude Overlapping Shape Areas* buttons under *Shape Modes*.



### Using the Pathfinder Palette

Locate the Pathfinder Palette by going to the *Menu Bar > Window > Pathfinder*. This palette allows you to create interesting interactions between two or more overlapping areas. To create the interaction, the objects must be selected. Hold down the **Shift Key** and use the **Selection Tool** to select multiple items. Next, choose the interaction you want by clicking one of the buttons under *Shape Modes*. Take time to mouse over each button to see what they do. For this exercise you will use the *Exclude Overlapping Shape Areas* button, circled in red on the illustration.

**NOTE:** Once you have selected objects and clicked one of the buttons under **Shape Modes**, you cannot click another button. You must either immediately undo the action (*Menu Bar > Edit > Undo*), or start over.