

How to Make Elegant Drawings in Microsoft Word

WORKSHOP HELD AT COLLEGE OF ALAMEDA

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*This is an outline of the activities and exercises we will attempt to cover at the workshop.
The complete set of notes (with some of the exercises) for the workshop
(a 22-page document) can be downloaded from the above website.*

Topics

- I. Setting Options, and customizing the Drawing toolbar
- II. The drawing grid. Aligning and distributing shapes
- III. Lines, arrows, and autosshapes
- IV. Using freeforms to create custom curves
- V. The three layers of a Word document. Inline vs. floating shapes.
Wrapping shapes around text. The Select Multiple Objects dialog box
- VI. Grouping and order of shapes
- VII. Transforming and enhancement of shapes
- VIII. Using Autocorrect to store custom drawings
- IX. Textboxes, callouts, and other text containers. Label boxes for drawings
- X. Word Art and 3D drawings
- XI. Converting documents to HTML and Adobe Acrobat formats

I. Setting Options, and customizing the Drawing toolbar.

RECOMMENDED OPTIONS

Under Tools, Options (**Alt-t o**), set the following:

“View” tab: Print and Web Layout Options—check Drawings and Object Anchors

“General” tab: If you are using Office XP, UNcheck “Automatically create Drawing Canvas when inserting AutoShapes”

(The Drawing Canvas is a new feature in Word 2002, designed to make it easy to create a complex shape. I have yet to discover any value to it, and find it to be simply a nuisance.)

“Edit” tab: Check “Enable click and type”. This may be useful when you are working with a drawing, since it allows you to position text in relation to the drawing without hitting the Enter key repeatedly.

If you are using Word 2002, I recommend unchecking “Show Paste Option Buttons”. These buttons get in the way, and even sneak there way into my web documents!

NOTE: DRAWINGS CAN ONLY BE VIEWED WHEN YOU ARE IN “PRINT LAYOUT” (OR “WEB LAYOUT”) VIEW, NOT WHEN YOU ARE IN SO-CALLED “NORMAL” VIEW.

In the menu bar, Tools, Autocorrect (**Alt-t o**), Options, check “Replace text as you type.”

























Customizing the Drawing Toolbar




To display the Drawing toolbar, click your *right-mouse button* on the grey area at the top of the window, which will bring down the Toolbars menu. Check “Drawing”.

I like to have certain buttons displayed on my toolbar. To put buttons onto the toolbar, you need to *customize* the toolbar: Click the *right-mouse button* on the grey area at the top of the window and choose the bottom-most item: Customize (You can just press the “c” key).

Click the Commands tab at the top of the dialog box, and under Categories click “Drawing”. You may then drag icons from the Commands list at the right onto the Drawing toolbar.










Here are the buttons I recommend putting on the toolbar:

	<u>Function:</u>
 Select Objects	Drag cursor over shapes to select them
 Select Multiple Objects	Opens a window with a list of shapes in the doc.
 Group	Makes selected shapes into a single shape
 Ungroup	Breaks up a grouped shape into its components
 Regroup	Undoes “Ungroup”
 Bring to Front	Puts shape on top of other shapes in same layer
 Send to Back	Puts shape under other shapes in same layer
 Bring in Front of Text	Puts shape into the main drawing layer
 Send Behind Text	Puts shape into the behind-text drawing layer
 Free Rotate	Displays four shape rotation handles
 Rotate Left	Rotates shape 90° counterclockwise
 Rotate Right	Rotates shape 90° clockwise
 Flip Horizontal	Reflects shape in its horizontal center line
 Flip Vertical	Reflects shape in its vertical center line
 Edit Points	Allows editing of nodes and segments of a freeform
 Curve	Draws a freeform using cubic Bezier curves
 Line	Line segment
 Arrow	Line segment with arrow head at end
 Double Arrow	Line segment with arrow head at both ends
 Rectangle	Rectangle Autoshape
 Isosceles Triangle	Adjustable triangle with base angles $\leq 90^\circ$
 Oval	Oval (ellipse) Autoshape (with Shift key: a circle)
 Arc	Draws one quadrant of an ellipse (with Shift: circle)
 Right Brace	Adjustable brace Autoshape

	Crop	Tool for cropping pictures: useful with “Print Scrn”
	Text Box	If text is selected, it goes into the text box
	Word Art	Create stylized, rotate-able text

In addition to these, you should have the following “pop-up” menus:

Function:

Draw ▾	Miscellaneous tools: some are on the toolbar.
AutoShapes ▾	Lines, freeforms, geom. shapes, callouts, etc.
 Drawing Grid	Dialog box for “Snap objects” and gridlines
 ▾ Fill Color	Fill shape with color, or make fill invisible
 ▾ Font Color	
 ▾ Line Color	
 Line Style	Adjust line thickness or multiplicity
 Dash Style	
 Arrow Style	Choose arrowheads for one or both ends of line
 Shadow Style	Give shapes a 3-D effect
 3-D Style	Turn Autosshapes into 3-D objects

HOW TO SAVE THESE SETTINGS

These changes are all stored in a “template” file called **normal.dot**. If you want to transfer the settings from one computer to another, you have to move this file to the appropriate directory on the target computer. Here is where normal.dot resides:

In Windows 98: C:\WINDOWS\Application Data\Microsoft\Templates

In Windows NT, 2000, or XP: Here you have to provide a “profile” name (“my name”):

C:\Documents and Settings\(*my name*)\WINDOWS\

Application Data\Microsoft\Templates

Batch files to make this process easier are available on my web site. Put them on a floppy disk. Then go to the Start Menu, Run.

To copy from Windows 98 to a floppy, type: **A:\NormalDotWin98ToA**

To copy from a floppy to Windows 98, type: **A:\NormalDotAToWin98**

To copy from Windows 2000 or XP to a floppy, type:

A:\NormalDotWinNTToA “myname”

To copy from a floppy to Windows 2000 or XP, type:

A:\NormalDotAToWinNT “myname”

(“my name” is your profile name).

II. The drawing grid. Aligning and distributing shapes

The Drawing Grid dialog box is accessed by clicking the  icon on the Drawing toolbar, or by clicking Grid from the Draw Dropdown menu on that toolbar.

EXERCISE: Check “Snap objects to grid”, set the grid spacing to 12 points in both directions, and check “Display gridlines on screen. Using the Rectangle AutoShape, make a 10 × 10 square. Fill the shape with 10 horizontal and 10 vertical lines.

EXERCISE: Experiment with “Snap objects to other objects”, and see where this might be useful.

III. Lines, arrows, and Autoshapes

EXERCISE: Practice using the following AutoShapes from the Drawing toolbar:

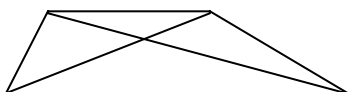
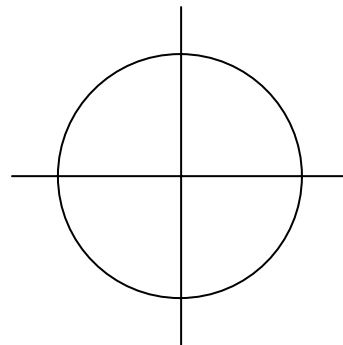
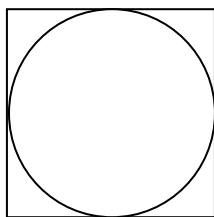
Line, Arrow, Double Arrow, Rectangle,
Isosceles Triangle, Oval, Right Brace

See what happens if you hold the Control key (**Ctrl**) down while you create the shape.
See what happens if you hold the **Shift** key down while you create the shape.
See what happens if you *double-click* the icon that you choose.

EXERCISE: Practice using the following AutoShapes from the AutoShapes Menu, Basic Shapes:

Parallelogram, Trapezoid, Diamond, Rounded Rectangle,
Hexagon, Octagon, Pentagon

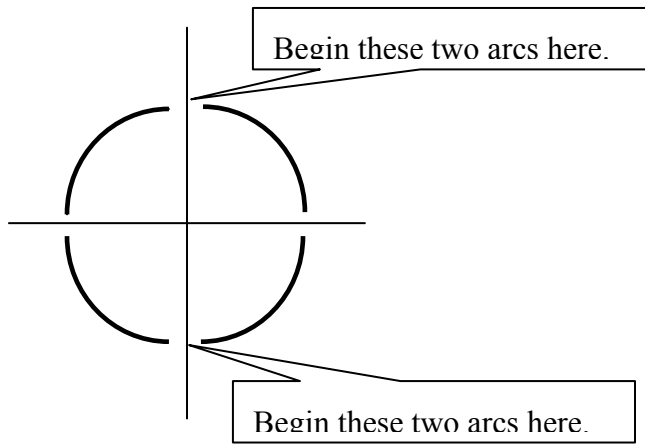
EXERCISE: Draw these.



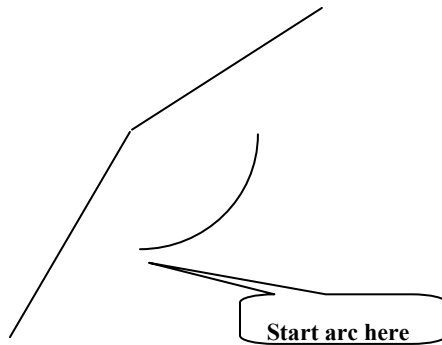
EXERCISE: Practice with the Arc Tool. When an arc is first created, you get one quadrant of an ellipse. If you hold the **Shift** key down while dragging, you get a quadrant of a circle.

There is a secret to making an arc: ALWAYS START BY MAKING A FULL QUARTER-CIRCLE ARC WHOSE CENTER COINCIDES WITH THE CENTER OF THE ARC YOU ARE LOOKING FOR. Then drag the adjustment handles to give the arc its desired span.

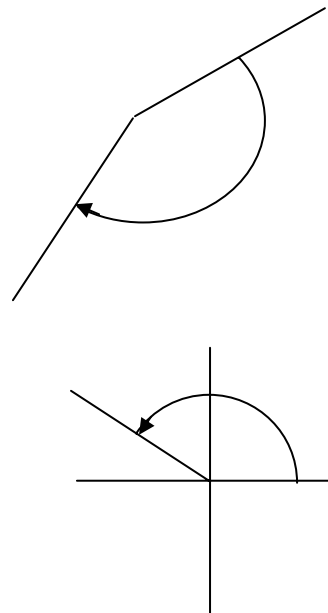
The following picture will help you understand this process:



Beginning of an arc construction:



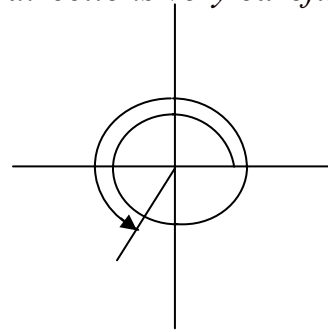
Final arc construction:



EXERCISE: Make the following drawing:

EXERCISE: Make this one:

Note: You won't succeed unless you follow the above directions very carefully!



EXERCISE: (Harder than it looks!) Draw this arc accurately.

Hint: Where is the center of the arc?

Imagine a coordinate system placed at that center, and make a 1st-quadrant arc overlapping the desired one. Then adjust the endpoints.



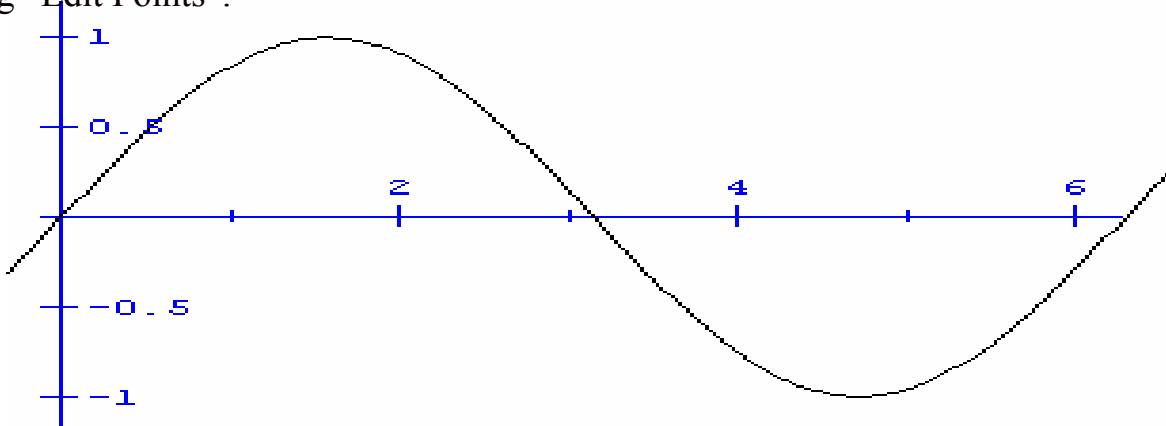
IV. Using freeforms to create custom curves

For making graphs of functions I recommend David Meredith's (X)PLORE program, available as a shareware program at:

[http://userwww.sfsu.edu/~meredith/X\(PLORE\)/xplorepg.html](http://userwww.sfsu.edu/~meredith/X(PLORE)/xplorepg.html)

EXERCISE: The following graph was created in X(PLORE). Trace the sine wave with the Curve tool to make a Freeform. Remember that every time you release and re-press the left mouse button, you get a new node and a new segment of the freeform. In places where the curve is fairly straight, the nodes can be far apart, but where there is greater curvature you want nodes fairly close together.

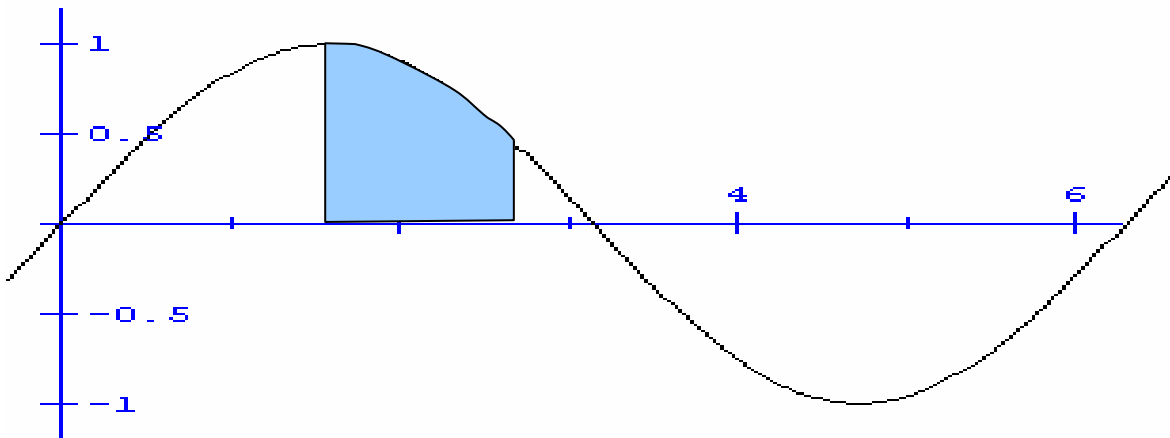
When you are finished, delete the original picture, and fine-tune your drawing using "Edit Points".



EXERCISE: Shading Areas Under Curves

We will create the shaded area shown below, using a freeform.

- (i) Zoom in on the graph to 150% (View Menu, Zoom, or the Zoom drop-down box in the Standard Menu).
- (ii) Trace the boundary of the region using the Curve tool. Use ONLY ONE segment for each straight part of the boundary. These segments won't be straight, but we'll fix that later.
- (iii) Now adjust the two top corner nodes: Go to "Edit Points", hold the mouse pointer over each one of them in turn and click the right mouse button. Choose the option "Corner point". A corner point has two adjustment handles that you can use to make the curve fit the contour you're after. Do this.
- (iv) You will find that the three segments that are supposed to be straight bulge out. Still in "Edit Points", and hold the mouse pointer over each one of them in turn and click the right mouse button. You will find an option: "Straight segment". That will straighten out the bulge.
- (v) Finally use the Fill Color tool to shade the interior of the freeform.
- (vi) Go back to the 100% Zoom setting.
- (vii) Group the freeform with the rest of the drawing.



V. The three layers of a Word document. Inline vs. floating shapes.

Wrapping shapes around text. The Select Multiple Objects dialog box

EXERCISE: Make several partially-overlapping AutoShapes on top of a block of text. Then practice with the Drawing toolbar icons:

Bring To Front, Send to Back, Bring in Front of Text, Send Behind Text

See how they behave in relation to the “three layers” of a Word document.

EXERCISE: Use a picture pasted into Word, such as the first sine wave graph above, and change it from a floating shape to an inline shape or vice versa. See what kind of mobility each type of shape has.

EXERCISE: Make an AutoShape on top of some existing text, and experiment with the different kinds of text wrapping (Draw menu, Text Wrapping).

Try the same thing with the sine wave drawing (shrink it to a smaller size and drag it over some text).

EXERCISE: See how the “Select Multiple Objects” dialog box works. You can use the spacebar to toggle the selection of each shape.

VI. Grouping and order of shapes. Anchors

EXERCISE: Drag one of the shape anchors to a different paragraph. Does the shape move with it?

Next drag the shape. Does the anchor move? What if you drag a shape from one page to the next?

EXERCISE: Go back to the previous drawing exercises and group each drawing into a single shape: First use the Select Object tool to select all the shapes to be grouped. Then do: Draw Menu, Group.

*Warning: when you use the Select Object tool, you have to get OUT of “Select Object” mode before you can get back to normal editing. Use the **Esc** key for the purpose.*

Next try UNGrouping one of your groups. Then select *one* member of the (former) group and do REgroup. What happens? Does Word remember who used to belong to the group?

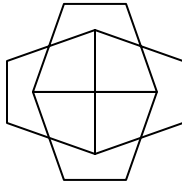
Instead of using the Select Object tool, try selecting each shape to be grouped, holding the **shift** key down as you do them.

VII. Transforming and enhancement of shapes

EXERCISE: Using one of the autoshapes, practice using the tools:

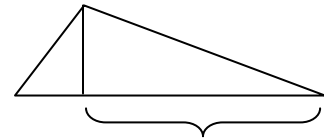
Free Rotate, Rotate Left, Rotate Right, Flip Horizontal, and Flip Vertical

EXERCISE: Using these tools, make this drawing starting with the Trapezoid AutoShape:



EXERCISE: Experiment with Fill Color, Line Color, Line Style, and Dash Style

EXERCISE: Draw this →



VIII. Using the Autocorrect feature to store custom drawings

EXERCISE: Drawings you may want to store as “Autocorrect Entries”:

(i) an xy-coordinate system: two perpendicular lines grouped with a text box (see [VII.](#))

(ii) A number line or a grid for making graphs. To make these, open the Drawing Grid dialog box (**Alt-r i**) and check Snap objects to grid, and set the Horizontal and Vertical spacing to control the spacing of your parallel lines. (The closest you can get to *no* spacing in one direction is 0.5 points).

(iii) A curve made with the Curve freeform tool.

EXERCISE: Make an Autocorrect entry for the sine wave freeform we created above.

(iv) A “label box” for adding labels to drawings (described below).

IX. Textboxes, callouts, and other text containers. Label boxes for drawings

EXERCISE: Select some text, and hit the Textbox icon on the Drawing toolbar. See if you can discover how to change the direction of the text from horizontal to vertical.

Next, change the textbox to an oval autoshape via:

Draw menu, Change AutoShape, Basic Shapes.

Finally, change the oval to one of the first four types of *callouts*, (Draw menu, Change AutoShape, Callouts) You should see a little yellow diamond for adjusting the callout pointer. Play with that.

EXERCISE: MAKE AN ALL-PURPOSE LABEL BOX FOR DRAWINGS

(i) Make a textbox a little larger than your typical drawing.

(ii) Select the textbox contents (a single paragraph mark), and choose a font for your labels. I have found that boldface font a few points smaller than the regular text size works best. So if my document uses 14 point font, I make my labels using 11 point, boldface type. When lecturing with an overhead projector, I use 18 point font, and my label boxes use 14 point.

(iii) Fill the textbox with space characters by holding down the spacebar until the cursor goes to the right side of the box; then hit the Enter key. Repeat until you get to the bottom of the box.

(iv) Click the boundary of the textbox to select it. Then hit the right mouse button to bring up a menu containing the option: Format Text Box. If you don't see this option, you have text selected rather than the textbox itself.

In the Format Text Box dialog box, click the Colors and Lines tab and under Line choose "No Line". Then click the Layout tab and choose: Send Behind Text.

(Note that all these settings are also available on the Drawing Toolbar.)

(v) Go to AutoCorrect (**Alt-t a**) and type a name that you will use to bring up this special text box. Also be sure Formatted Text box is checked.

(vi) Now when you type the shortcut, the label box will appear. *However, you won't be able to see it!* Since you made the lines and fill invisible, the box will only be visible when it is *selected*. If you know approximately where it is on the page and click the

mouse there, you will see it. If that's hard to do, click the Select Multiple Objects icon on the Drawing toolbar and check the last item on the list. That will be your label box.

(vii) Now anytime you make a drawing, slip a label box over it, type any desired labels inside it, and group the label box with the rest of the drawing. (For this purpose, you may need to use the Select Multiple Objects dialog box.)

X. Word Art and 3D drawings

EXERCISE: Select some text, and click the Word Art icon. Try changing the dimensions of the Word Art shape, and try rotating it.

EXERCISE: Download my file "Rulers and Protractors" to see a serious application of Word Art.

EXERCISE: Most Autosshapes (and textboxes) can be turned into 3D shapes. Experiment with the 3D-Style tool, and on that menu, open the 3-D Settings toolbar and see what's there.

EXERCISE: Conspicuously absent from the 3-D shapes is a *sphere*.

Make your own sphere as follows:

Make a circle as an outer boundary, and then put it a set of ovals to show latitude lines. Now comes the real challenge: Show lines of longitude using the Arc Tool. Follow the rules for making arcs given in Topic [III](#). Group all the pieces together.

XI. Converting documents to HTML and Adobe Acrobat formats

EXERCISE: Go to File Menu, Web Page Preview and see what your document would look like as a web page. Also try Save as Web Page and see what you get.

I have found that I get much better mathematical documents by converting Word files into Adobe Acrobat (.pdf) format. The software for doing this is available for around \$70 with academic pricing from EdTech <http://www2.h-net.msu.edu/~edweb/> or from Gradware www.gradware.com.

You will find many examples of this on my class websites, accessible through <http://lenfellman.home.comcast.net>.