

Chapter 1

Introducing Grapher

Introduction to Grapher

Welcome to **Grapher**[™], the easy-to-use technical graphics package for scientists, engineers, business professionals, or anyone who needs to generate graphs quickly and easily. With **Grapher**, you can create the following types of plots:

Line/Scatter	Wind Chart
Function	Box-Whisker Plot
Step Plot	Bubble Plot
Bar Chart	Hi-Low-Close
Floating Bar	Pie Chart
Histogram	Ternary Diagram
Polar	Ribbon/Wall
Polar Function	XYZ Plot
Rose Diagram	

With **Grapher**, creating a graph is as easy as choosing the graph type, selecting the data file, and clicking the OK button. **Grapher** automatically selects reasonable default settings for each new graph, though all of the graph settings can be modified. For example, you can change tick mark spacing, tick labels, axis labels, axis length, grid lines, line colors, symbol styles, and more. You can even add legends, bitmaps, fit curves, and drawing objects to the graph. To apply the same custom settings to several graphs, you can create a **Grapher** template containing the desired styles. Advanced automation can be incorporated using Golden Software's **Scripter**[™] program or any Active X automation program. Once your graph is complete, export it in a variety of formats for use in presentations and publications.

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New Features

General

- **Grapher** is designed for Windows 98, Me, 2000, and XP
- A new HTML-based help system allows advanced searching options
- Several new script examples have been added

2D Graphs

- Added polar function plots
- Added wind charts
- Modified rose diagrams so that you can create custom bins
- Connect points in ternary diagrams
- Added new symbols to bubble plots

3D XYY Graphs

Added 3D XYY ribbon/wall, function, step plot, bar chart, floating bar, and histogram plots

3D XYZ Graph

Added an XYZ plot

Graphing Features

- Create error bars on bar charts
- Change from one plot type to another
- Fill between multiple plots
- Fill plots to the left and right in addition to filling up and down
- Calculate the area under a line/scatter plot

Axes

- Added a natural log scale for axes
- Added the ability to break axes

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User Interface Features

- Eliminated the 32 inch page limit under Windows 98 and Me
- Reload data files that are edited in other programs such as Excel
- A large cross hair cursor is used in digitizing
- Display point information when clicking on a plot
- Improved the **Object Manager**
- Store the data file with the graph in the new **Grapher Project** files [.GPJ]
- Save **Grapher** files [.GRF] in the **Grapher 3** format
- Added an Excel interface
- Added a date/time format to the program that can be used in the worksheet, when creating plots, and when editing the plots (e.g. clipping)



Worksheet

Up to one billion rows and columns are available in the worksheet

Screen Layout and Window Types

Grapher contains four document window types, the plot window, template window, worksheet window, and an Excel worksheet window. Graphs are displayed and created in the plot window. Template graphs are created in the template window. The worksheet window and Excel worksheet are used to display, edit, transform, and save data in a tabular format.

Opening Windows

Selecting the **File | Open** command or clicking the  button opens any of the window types, depending on the type of file selected. The **File | New** command or clicking the  button creates a new plot window, template window, worksheet window, or Excel window.




Open Excel

The **File | Open Excel** command opens an [.XLS] file using Microsoft Excel. All commands and features of Excel are available in **Grapher** when using this command, and you can easily create graphs from the Excel window using the **New Graph** menu.

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Styles

The **View | Style** command controls the display of the plot window.

- Choose **Standard** or click  to display a single plot window.
- Choose **Window w/Object Manager** or click  to display the plot window along with the **Object Manager** on the right side of the screen. When the **Object Manager** is displayed in this manner, it can remain open while you work.
- Choose **Window w/Worksheets** or click  to display the worksheets used in graphs. The worksheets are displayed on the right side of the window. If you have used multiple worksheets to create graphs, the graphs are listed as sheets with numbered tabs. Click the numbered tab at the bottom of the worksheet view to change the data display. In addition, you can use the *File, Edit, Format, Data, and New Graph* buttons to manage your data and create new graphs within this window.

When you choose **Window w/Object Manager** or **Window w/Worksheets**, you can change the size of the plot window, **Object Manager**, or worksheet by dragging the dividing line.

Toolbars

All window types in **Grapher** include toolbars that contain buttons for many common commands. The toolbars are initially docked, but they can be dragged and placed anywhere on the screen.

Status Bar

Click on **View | Status Bar** to show or hide the status bar. The status bar displays information about the current command or activity in **Grapher**. A check mark next to **Status Bar** indicates that the status bar is displayed. The status bar is divided into three sections.



The status bar provides information about commands, objects, and the cursor.

- The left section shows the selected object name. If a menu command is selected, a brief description of the command appears here instead of the object name.
- The middle section shows the pointer coordinates in inches or centimeters. This area also displays the graph's XY coordinates when using **Graph | Digitize**, **Graph | Digitize Fixed**, or when *Display value on click* is enabled. See *Chapter 14, Preferences* for more information on *Display value on click*.
- The right section shows the dimensions of the selected object.

In the worksheet, the status bar displays ToolTips.

Scripter

Tasks can be automated in **Grapher** using Golden Software's **Scripter** program or any ActiveX Automation-compatible client, such as Visual BASIC. A script is a text file containing a series of instructions for execution when the script is run. **Scripter** can be used to perform almost any task in **Grapher**. For more information, see *Chapter 13, Automating Grapher* in the User's Guide or use the **Help | Automation Help** command.

File Types

Grapher uses four basic file types: data, graphics, **Grapher** template files [.GRT], **Grapher** project files [.GPJ], and **Grapher** files [.GRF].

Data Files

Data files contain the input data and are used to produce graphs. These files are generally referred to as "XY data files" or "data files" throughout the documentation. Data can be read from various file types, and must contain numeric or date/time XY locations.

Graphic Files

Graphic files can be vector files, metafiles, or bitmap files. These files are not used in creating graphs but can be used as information in plot windows; for example, company logos can be added to a plot by importing a graphic file.

Template Files

Template graphs are used to set graphing preferences in **Grapher**. When a template file is saved, it does not contain any reference to a data file. This means that once the template graph is created, you can use the template with any data set. For example, you can use the template to set options such as the number of decimal places on axis tick mark labels, label angles, axis labels, graph titles, line plot colors, or any other graphing option.

Grapher Project Files

Grapher project files [.GPJ] store data with the graph rather than saving a reference to the data file as with **Grapher** project [.GRF] files. If you save as a [.GPJ] file, you do not need to send an additional data file when sharing or moving graphs.

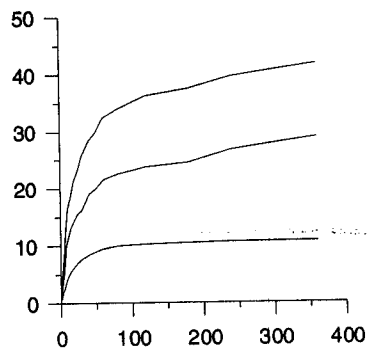
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Grapher Files

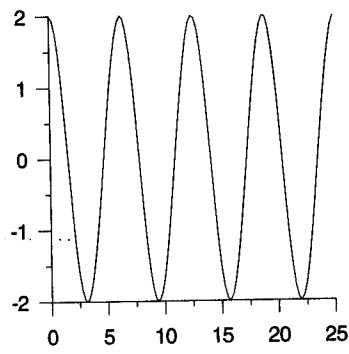
Grapher files [.GRF] preserve all the objects and object settings contained in a plot window. These files are called **Grapher** files [.GRF] throughout the documentation.

Plot Types

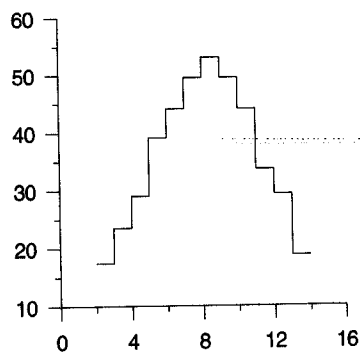
Several different plot types can be created, modified, and displayed with **Grapher**. An example of each plot type is shown below.



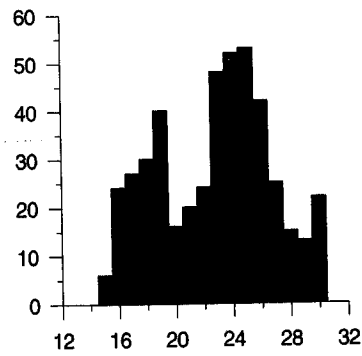
Line/Scatter



2D Function

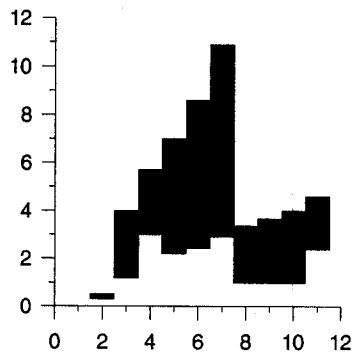


2D Step Plot

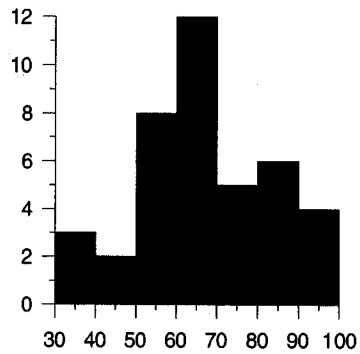


2D Bar Chart

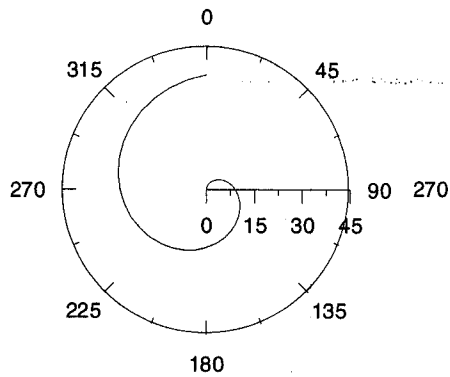
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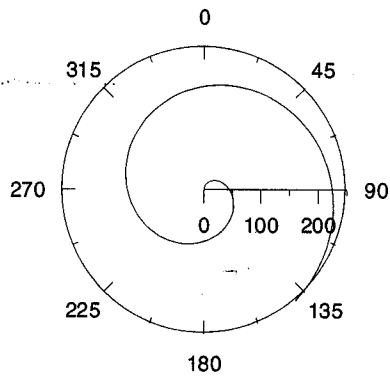
2D Floating Bar



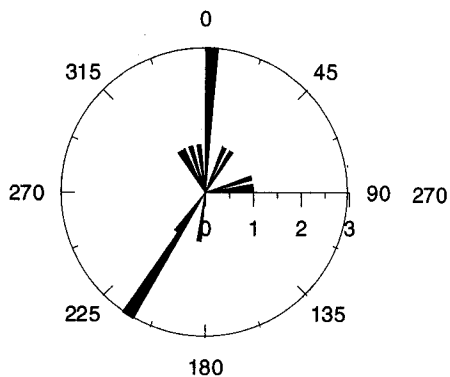
2D Histogram



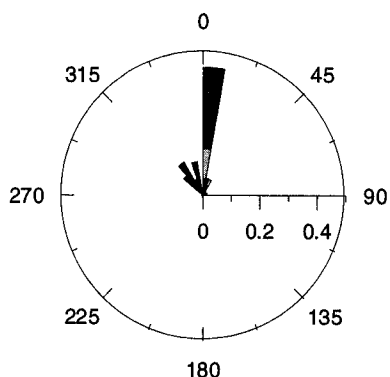
Polar



Polar Function

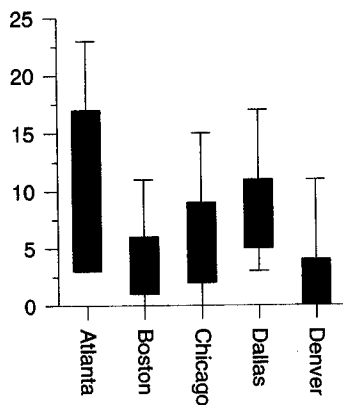


Rose Diagram

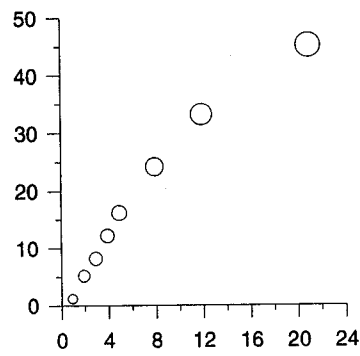


Wind Chart

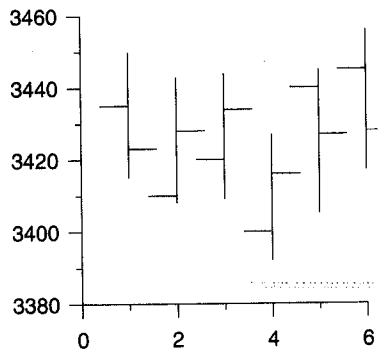
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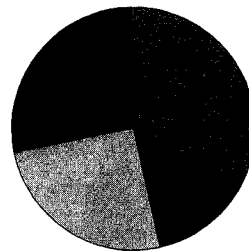
Box-Whisker Plot



Bubble Plot

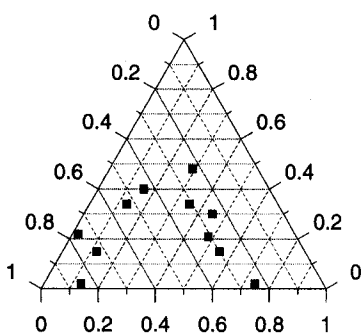


Hi-Low-Close

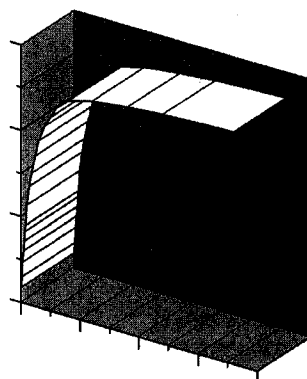


Pie Chart

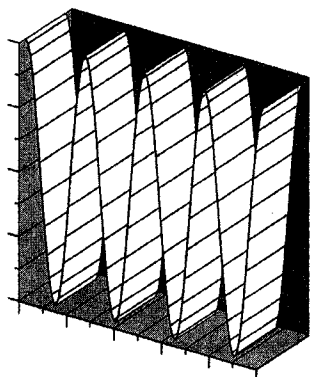
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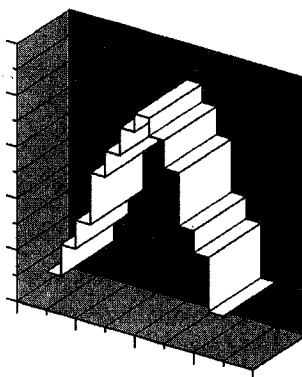
Ternary Diagram



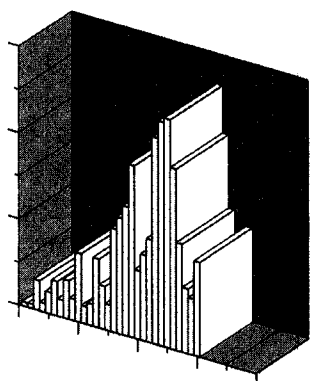
Ribbon/Wall



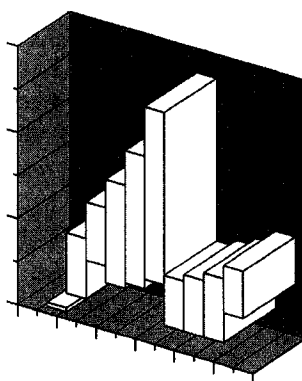
3D XYY Function



3D XYY Step Plot

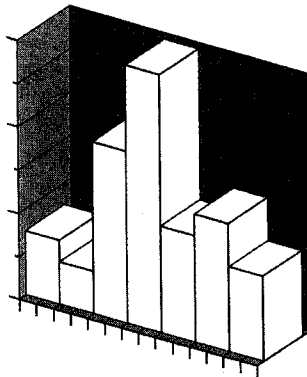


3D XYY Bar Chart

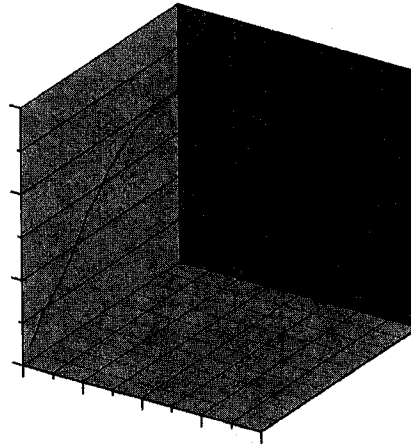


3D XYY Floating Bar

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3D XYY Histogram



3D XYZ Plot

System Requirements

- Operating System: Windows 98, Me, XP, 2000, or higher
- Monitor Resolution: 800 X 600 X 256 colors minimum
- Hard Disk: At least 25 MB of free hard disk space
- RAM: 32 MB free minimum, 64 MB free recommended
- CPU: 100 MHz Pentium processor minimum

A Note about the User's Guide and Online Help

Various font styles are used throughout the **Grapher** User's Guide and online help. **Bold** text indicates menu commands, dialog names, and page names. *Italic* text indicates items within a dialog such as group box names, options, and field names. For example, the **Import File** dialog contains a *Look in* drop-down list. Bold and italic text may occasionally be used for emphasis.

Also, menu commands appear as **Draw | Text**. This means, "click on the **Draw** menu at the top of the plot window, then click on **Text** within the **Draw** menu list." The first word is always the menu name, followed by the commands within the menu list.

Installation Directions

Golden Software does not recommend installing **Grapher 4** over any previous version of **Grapher**. **Grapher** DOS, 1, 2, 3, and 4 can coexist on the same computer as long as they are installed in separate directories.

To install and run **Grapher 4** on Windows XP or 2000, you need to have administrator rights for that computer.

To install **Grapher**:

1. Insert the **Grapher** CD in the CD-ROM drive. The install program automatically begins on most computers.
2. Choose **Install Grapher** from the **Grapher Auto Setup** dialog to begin the installation.

If the installation does not begin automatically, double-click on setup.exe in Windows Explorer.

Network Installation

An administrative install may be performed in order to install files to a network server. Once installed on the network server, individual workstation installations can be performed. The server software must support long file names.

ATTENTION: You may use **Grapher** on a networked system if the number of **Grapher** users on the network at one time does not exceed the number of licensed copies of **Grapher**.

To install **Grapher** on the server:

1. Log on to the file server with administrator rights.
2. Click **Start | Run**.
3. Enter the path to SETUP.EXE followed by /a. For example, r:\Setup.exe /a
4. When setup asks for a destination folder, choose one on the file server (e.g. C:\GrapherServer). This should be a new, empty directory. Setup copies all the **Grapher** files plus the setup program and its associated files to the server drive.
5. We recommend flagging the server folder contents as read-only.

NOTE: If you wish to run **Grapher** on a Windows server itself, you will need to run setup again without the /a switch and install **Grapher** normally to a new directory.

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Next, install **Grapher** at each workstation:

1. Log on to the file server from each workstation that will run **Grapher**.
2. Start Windows and run the copy of SETUP.EXE located in the server folder.
3. When the setup asks for a destination folder, choose one on the local hard drive.

You will need to enter a **Grapher** serial number the first time **Grapher** is run on each workstation.

Troubleshooting Installations

If you are experiencing errors with the installation, please install **Grapher** with error logging.

To create an installation error log:

1. In Windows, go to **Start | Run**.
2. Type [drive letter]:[path]\setup.exe" /V"/L* [drive letter]:[path]\G4.log
Replace the [drive letter] and [path] with a drive letter and path on your computer. The path to the log file cannot contain spaces.
3. Click OK. After the installation process terminates, the log file is created in the path you specify. Please send the log file to technical support along with the installation message text.

Updating Grapher

To update your version of **Grapher**, open the program and select **Help | Check for Update**.

Do not install a newer FULL version of **Grapher 4** over a previous version of **Grapher 4**. This does not update the software. (i.e. Do not install 4.02 over 4.00.) If for some reason you need to do a full installation of **Grapher 4**, uninstall the previous version before installing the updated version.

Uninstalling Grapher


To uninstall **Grapher**, use Add/Remove Programs in the Control Panel. You can access the Control Panel by clicking the Windows Start button, clicking on Settings, and then clicking on Control Panel. You may be prompted to insert the CD to uninstall the program.


Getting Help

Online Help

The User's Guide is just one part of the documentation for **Grapher**. Extensive additional information about **Grapher** is located in the online help. To access online help, choose **Help | Contents** for a hierarchical arrangement of help topics. By clicking on the topic of interest, information regarding the topic appears.

Context-Sensitive Help

Grapher also contains context-sensitive help. Highlight a menu command, window region, or dialog box, press the F1 key, and help is displayed for the highlighted item. Another way to access context-sensitive help is by clicking on the context-sensitive help button. After clicking the  button, the cursor appears with a ? next to it. Simply select the item for which help is desired with the modified pointer and a help window appears.

In addition, the dialog boxes contain a help button. When you have an open dialog, click the  button in the dialog title bar to obtain help for that dialog. Many dialog details are contained in online help.

Internet

There are several Web resources available for help.

- Click the *Forum* button in online help to research a **Grapher** question or to post a question.
- You can use the **Help | Feedback** command to send a problem report, suggestion, or information request by e-mail.
- You can search the FAQs on our web page at www.goldensoftware.com. Direct links to the FAQs, the main **Grapher** product page, and the Golden Software main website are available by selecting **Help | Golden Software on the Web**.

Technical Support

Golden Software's technical support is free to registered users of Golden Software products. Our technical support staff is trained to help you find answers to your questions quickly and accurately. We are happy to answer any of your questions about any of our products, both before and after your purchase. We also welcome suggestions for improvements to our software and encourage you to contact us with any ideas you may have for adding new features and capabilities to our programs.

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Technical support is available Monday through Friday 8:00 AM to 5:00 PM Mountain Time, excluding major United States holidays. We respond to e-mail and fax technical questions within one business day. When contacting us with your question, have the following information available:

- Your **Grapher** serial number (located in the front cover of this User's Guide or in **Help | About Grapher**)
- Your **Grapher** version number, found in **Help | About Grapher**
- The operating system you are using (Windows 98, Me, XP, or 2000)
- The exact wording of the first error message that appears (if any)

Contact Information

Telephone: 303-279-1021

Fax: 303-279-0909

E-mail: graphersupport@goldensoftware.com

Web: www.goldensoftware.com (includes FAQs and support forum)

Mail: Golden Software, Inc., 809 14th Street, Golden, Colorado, 80401-1866, USA

Chapter 2

Tutorial

Tutorial Introduction

This tutorial is designed to introduce you to some of **Grapher's** basic features. After you have completed the tutorial, you should be able to begin creating your own graphs.

Tutorial Lessons

The following is an overview of lessons included in the tutorial.

- *Lesson 1 - Creating a Graph* shows you one way to create a graph.
- *Lesson 2 - Viewing Data* shows you how to open a data file used in the graph.
- *Lesson 3 - Modifying Graph Properties* show you how to open the graph properties and change the plot characteristics.
- *Lesson 4 - Editing Axes* shows you how to add an axis title and change tick mark spacing.
- *Lesson 5 - Adding to a Graph* shows you how to add a plot and legend to the graph.
- *Lesson 6 - Saving Graphs* shows you how to save a graph.
- *Lesson 7 - Graphing with Multiple Axes* is an optional lesson that shows you how to create a graph with one X axis and two different Y axes.

The lessons should be completed in order; however, they do not need to be completed in one session.

Starting Grapher

To begin a **Grapher** session:

1. Click on the Windows **Start** button.
2. Navigate to **Programs | Golden Software Grapher 4** and then click **Grapher 4**.
3. **Grapher** starts with a new empty plot window. This is the work area where you can produce graphs. If this is the first time that you have opened **Grapher**, you will be prompted for your serial number. Your serial number is located on the inside front cover of this User's Guide.

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Lesson 1 - Creating a Graph

You can create graphs in several ways in **Grapher**. Graphs can be created:


- from the plot window **Graph** menu,
- with the graph wizard,
- from the worksheet,
- and from templates.

All of these methods are discussed in *Chapter 4, Creating Graphs*. In the tutorial, we will use the most common method, creating a graph through the **Graph** menu, to create a line/scatter plot from an existing data set.

If you have not opened **Grapher** already, open the program using the directions on the previous page.

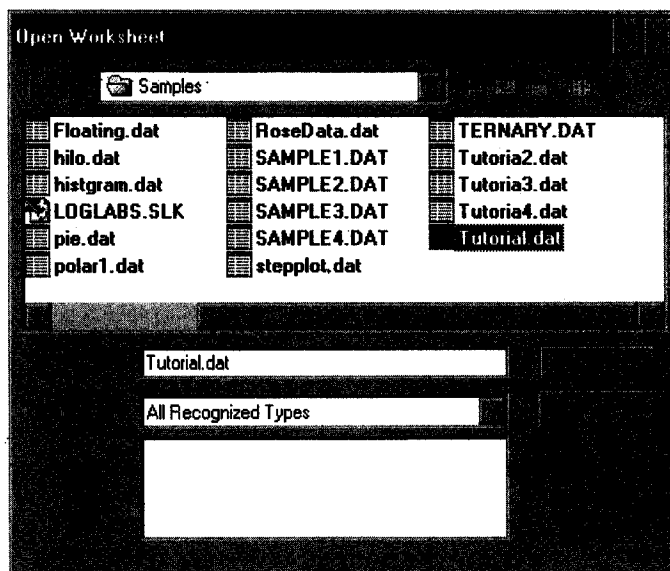
To create a line/scatter graph:

1. Click the **Graph | 2D Graphs | Line/Scatter**

command or click the  button.

2. The **Open Worksheet** dialog opens. Browse to **Grapher 4's SAMPLES** folder using the *Look in* list. The location of this folder varies depending on where the software was installed. If the software was installed in the default directory, the path is `\Program Files\Golden Software\Grapher4\Samples`.

3. Double-click on the **TUTORIAL.DAT** file in the **SAMPLES** folder to open it. Alternatively, you can click on the **TUTORIAL.DAT** file once and then click the *Open* button.
4. The line/scatter plot properties dialog opens with the **Line Plot** page on top.

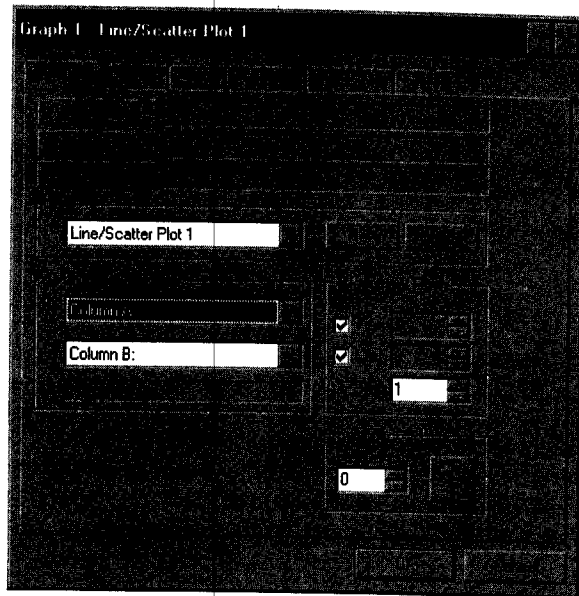


Double-click on the **TUTORIAL.DAT** file to open it.

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Look at the *Worksheet Columns* group. This group shows the data columns to plot on each axis. By default, **Grapher** uses the first two columns in the data file, in this case, X is equal to Column A and Y is equal to Column B.

Notice that "0 data points" appears under the column selections. This indicates that one or both of the selected columns do not contain valid numeric data and an empty graph would be created if we left the columns at the defaults.



If the first two columns do not contain valid data, then 0 data points is recorded under the column selections in the Worksheet Columns group. A graph made with this data would be empty.

To create a plot in the graph, two columns of data must be selected. Change the default data columns by clicking on the down arrow button to the right of each field and choosing the following columns from the list:

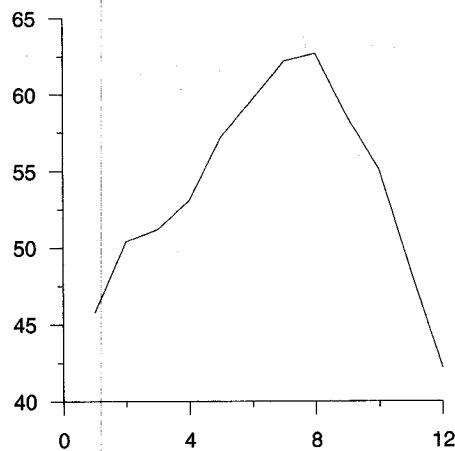
X: Column B

Y: Column C: Site A

Notice that "12 data points" now appears under the column selections.

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- Click the OK button to draw the graph.



When using Column B and Column C as the X and Y variables, your graph should look like this graph.

USE THE TEXT TOOL, PUT YOUR NAME ON PLOT, AND PRINT


Lesson 2 - Viewing Data

If your plot does not turn out like you expected or if you would like to edit data, you can open the data file in **Grapher**. There are several ways to open a data file. The most common method, **Graph | Display Worksheet**, is covered here. The other methods are discussed in the *Data in the Plot* section of Chapter 3, *Data Files and the Worksheet*.

In the previous lesson, the plot would not exist if we had used the first two data columns to create the graph. So, let's look at that data set to find the reason for this.

To open the data:

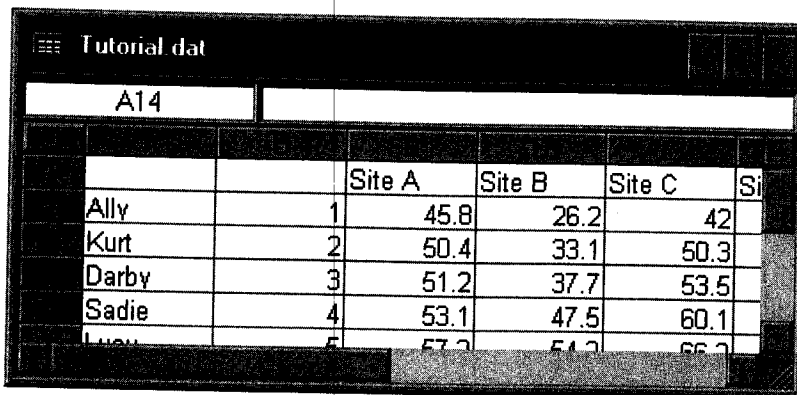
- Click on the plot line. If you have successfully selected the plot, the status bar should say *Line/Scatter Plot 1 selected*. The status bar is located in the lower border of the **Grapher** window. If the status bar says *Graph 1 selected* click outside the graph and then click on the plot line again.



The status bar should say *Line/Scatter Plot 1 selected* if the plot is properly selected.

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- Once the plot is selected, select **Graph | Display Worksheet**.



		Site A	Site B	Site C	Site D
Ally	1	45.8	26.2	42.1	38.5
Kurt	2	50.4	33.1	50.3	45.2
Darby	3	51.2	37.7	53.5	48.9
Sadie	4	53.1	47.5	60.1	55.3
Lucy	5	57.2	51.2	66.2	60.1

TUTORIAL.DAT contains text in Column A, so this information cannot be used to create a graph.

Notice that Column A contains text, not numeric data. This is the reason "0 data points" appears when attempting to create a graph with the default columns. **Grapher** needs data formatted as numbers or dates in order to create a graph.

In addition, Columns C through J contain headers in Row 1. Headers make it much easier to determine the data used in the graph.

To return to the plot window containing the graph, click the **Window** menu and then select **Plot1**. (If you have opened more than one plot window, click on the plot name containing the graph created in *Lesson 1, Creating a Graph*.)

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Lesson 3 - Modifying Graph Properties

Once you have created a graph, you can edit its properties. You can edit the axis size, tick mark spacing, plot line color, and just about anything you see on the graph.

Opening Object Properties

There are several ways to access the properties of an object (e.g. axis, plot, legend, etc.).

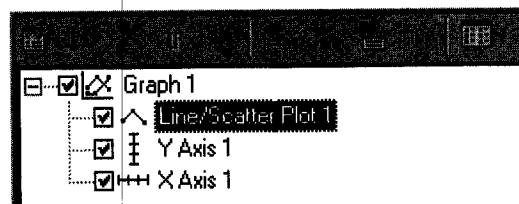
To change the features of an object, you can open its properties by

- double-clicking on the object in the plot window,
- double-clicking on the object name in the **Object Manager**,
- right-clicking on the object and choosing **Properties** in the context menu,
- or clicking **Edit | Properties** when the object is selected.


In this example, let's change the line plot created in *Lesson 1, Creating a Graph* to a scatter plot, using the **Object Manager** to open the object properties. The **Object Manager** is the easiest way to select the exact object you want so this is the method used throughout the rest of the tutorial. The graph from *Lesson 1, Creating a Graph* should already exist in the plot window before proceeding with this lesson.

To change the line plot to a scatter plot:

1. Click **View | Style | Window w/Object Manager** or click the  button. This opens a list of all the objects in the plot window.



*The graph created in lesson one contains a line/scatter plot and two axes, as indicated in the **Object Manager**.*

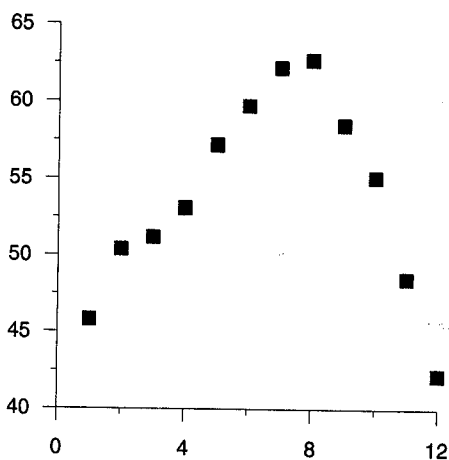
2. Click the *Line/Scatter Plot 1* object and then click the  button. This opens the **Line/Scatter Plot 1** properties dialog.

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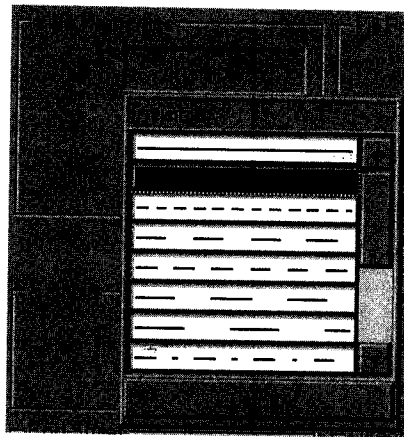
3. The line/scatter plot symbol properties are located in the lower right corner of the **Line Plot** page. Change the frequency of the symbols from 0 to 1 by clicking the up arrow once.
4. Click the symbol button to the right of the *Frequency* field to open the symbol properties. Change the symbol from a cross to a filled square and then click the OK button to return to the line/scatter plot properties dialog.
5. Drag the dialog off to one side and then click the *Apply* button to see the symbols.
6. Click the **Line-Fill** tab in the line/scatter plot properties dialog.
7. Click the *Style* button in the *Line Properties* group and click on the *Invisible* line style (second in the list).
8. Click the OK button to draw the line/scatter plot as a scatter plot.



Click the up arrow once to change the symbol frequency to one and add symbols to the line/scatter plot.



A scatter plot is created by changing the line style to invisible.



Click the Style button to select an invisible line style.

- MODIFY GRAPH

- USE TEXT TOOL,

PUT YOUR NAME ON GRAPH
AND PRINT



Chapter 2 - Tutorial

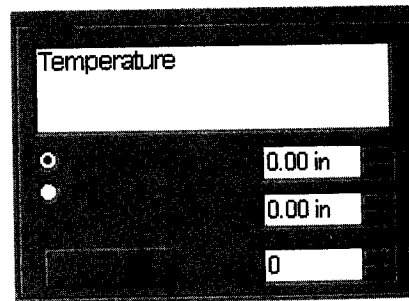
Lesson 4 - Editing Axes

Grapher's axes can be modified to fit any design needs. The axis scale, axis length, tick spacing, tick mark labels, axis titles, colors, etc., can all be customized. The following section shows how to modify the axes of the graph created in *Lesson 1, Creating a Graph*.

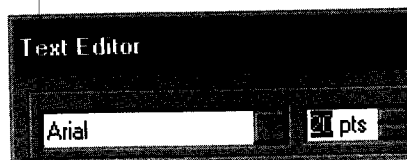
Adding Axis Titles

Axis titles let you identify the variables represented by each axis.

1. If the **Object Manager** is not already open, click **View | Style | Window w/Object Manager** or click the  button. This opens a list of all the objects in the plot window.
2. Click on the name *Y Axis 1* in the **Object Manager**.
3. Click the  button to open the axis properties dialog.
4. On the **Axis** page, enter the word "Temperature" into the *Title* box (without quotes).
5. Next, let's change the properties of the axis title. Click the *Editor* button in the *Title* box to open the **Text Editor** dialog.
6. In the **Text Editor** dialog, highlight the word "Temperature" and change the font size to 20 points. The font size is located to the right of the font name in the upper left corner of the dialog. To change the font size, highlight the existing number and type 20 or use the up arrow to scroll to the new font size. Note: only the highlighted text changes size.



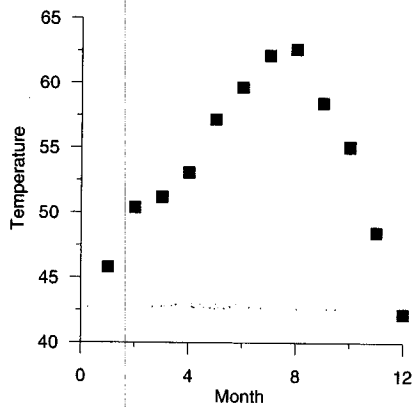
Type the axis title into the Title box on the Axis page.



The font size is located in the upper left corner of the Text Editor dialog.

7. Click the OK button to close the **Text Editor** dialog.
8. Click the OK button in the axis properties dialog to add the title to the axis. Note that the word "Temperature" now appears along the Y axis.

Use this same procedure to add the title "Month" to the X axis.





*In **Grapher**, you can add axis titles to each axis.*

Tick Marks

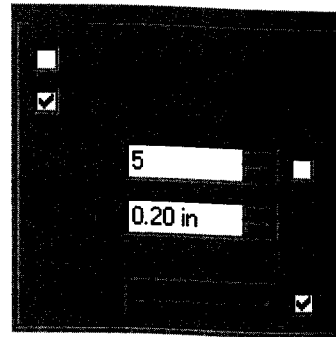
Tick marks are a means of indicating units of measure, and are normally equally spaced like the lines on a ruler. Tick marks are the lines that protrude perpendicularly from an axis. Longer tick marks are typically the major tick marks while the shorter tick marks between them are the minor tick marks. In the graph created in *Lesson 1: Creating a Graph*, the major tick mark spacing on the Y axis is five units (i.e. 40, 45, 50, 55, 60, and 65). In the following exercise, the tick spacing is changed to two units.

To change the tick mark spacing:

1. If the **Object Manager** is not already open, click **View | Style | Window w/Object Manager** or click the  button. This opens a list of all the objects in the plot window.
2. Click on the name *Y Axis 1* in the **Object Manager**.
3. Click the  button to open the axis properties dialog.
4. Click the **Tick Marks** tab.

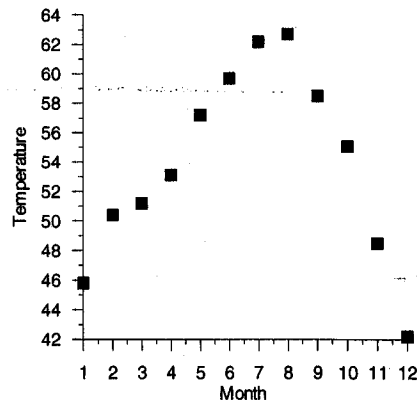
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5. In the *Major* group, click in the *Auto* check box to the right of the *Spacing* box to remove the check mark. This allows custom tick mark spacing.
6. In the *Spacing* box, change the number 5 to the number 2. You can type the number 2 directly into the box, or you can click the down arrow until the number 2 is displayed.
7. Click the OK button in the Y axis properties dialog. Notice that the tick marks now appear at two unit intervals.



Click in the Auto box next to the Spacing field to remove the check mark in the box.

Apply this same procedure to edit the X axis and change the tick mark spacing from 4 to 1.



The preceding steps change the Y axis tick mark spacing to 2 and the X axis tick mark spacing to 1.



PUT YOUR NAME, TITLE ON GRAPH,
AND PRINT

Lesson 5 - Adding to a Graph

Once a graph is created, you can add additional plots, legends, axes, and graph titles. These objects are discussed in detail in *Chapter 10, Graph Features*.

Adding Additional Plots to a Graph

You can add several plots to one graph in **Grapher**. In TUTORIAL.DAT, Columns C through J all contain Y data, making it simple to add additional plots to the graph.

1. If the **Object Manager** is not already open, click **View | Style | Window w/Object Manager** or click the  button. This opens a list of all the objects in the plot window.
2. Click the *Line/Scatter Plot 1* object and then click the  button. This opens the **Line/Scatter Plot 1** properties dialog.
3. In the *Plot* group, click the *New* button to create a curve from the next data column. Once the *New* button is clicked, the dialog title changes to **Line/Scatter Plot 2** and the Y column changes to Column D: Site B in the *Worksheet Columns* group.



Click the New button to add a new line/scatter plot to the existing graph.

4. Drag the dialog off to one side to see the changes to the graph.

When creating additional plots in this manner, the plot increments the Y column and it uses the same properties as the existing plot. All of the data must be contained in one data file to use the *New* button. In addition, not all plot types have this option, so refer to the plot chapters (Chapters 5 through 8) for more information on adding additional plots to a graph.



To help differentiate between the plots, let's remove the symbols and add a line to the plot. The dialog should still be open after completing step 4 in the previous set of instructions.

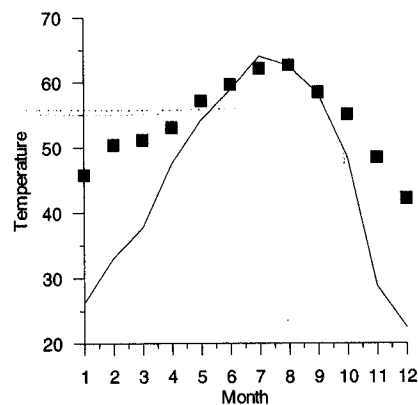
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To change the properties of the second line/scatter plot:

1. On the **Line Plot** page, change the symbol *Frequency* to zero by typing the number 0 or by clicking the down arrow one time.
2. Click the **Line-Fill** page.
3. Click the **Style** button in the *Line Properties* group and change the line style to *Solid*.
4. Click the OK button to draw the plot as a solid line.

Adding a new plot makes the Y tick mark spacing too close. This is easily changed by editing the axis properties, just as in *Lesson 4, Editing Axes*.

1. If the **Object Manager** is not already open, click **View | Style | Window w/Object Manager** or click the  button. This opens a list of all the objects in the plot window.
2. Click on the name *Y Axis 1* in the **Object Manager**.
3. Click the  button to open the axis properties dialog.
4. Click the **Tick Marks** tab.
5. In the *Spacing* box, change the number 2 to the number 10. You can type the number 10 directly into the box, or you can click the up arrow until the number 10 is displayed.
6. Click the OK button in the Y axis properties dialog.





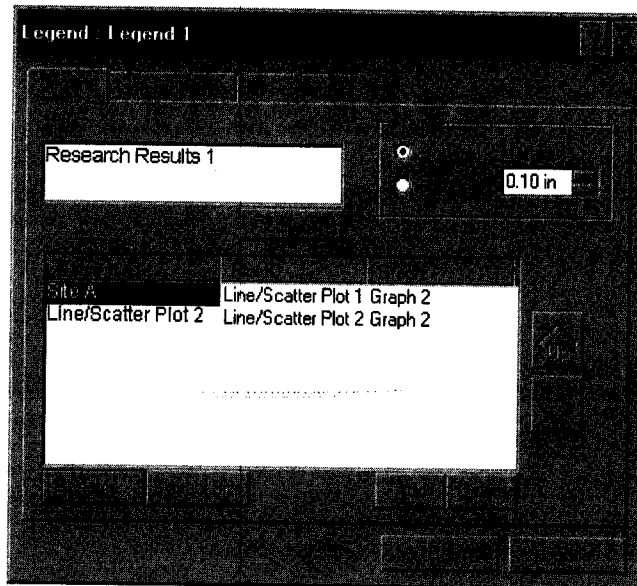
A second line/scatter plot can be added to the graph by clicking the New button in the line/scatter plot properties dialog.

Adding a Legend

Legends provide information for interpreting a graph.

To add a legend:

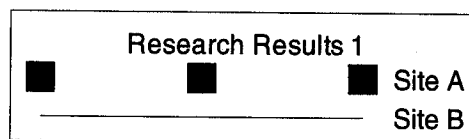
1. If the **Object Manager** is not already open, click **View | Style | Window w/Object Manager** or click the  button. This opens a list of all the objects in the plot window.
2. Click on any object name for the graph in the **Object Manager**.
3. Click the **Graph | Add to Graph | Legend** command or click the  button in the **Object Manager** to open the legend dialog.
4. On the **Legend** page, the title defaults to the graph name such as Graph 1. You can type a new, descriptive title into the *Title* box, such as Research Results 1.



The legend title and plot names can be customized in Grapher.

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5. The plot names can also be made more descriptive. Click the plot name under the *Name* column, and then click the *Rename* button. Highlight the contents of the **Text Editor** dialog and then type new text to change the name. In this case, line/scatter plot 1 used a column labeled Site A, so the name was changed to Site A. Line/scatter plot 2 uses Site B, so this name can also be changed to Site B.
6. Click the OK button to draw the legend.
7. You can move the legend by clicking on it in the plot window, holding down the left mouse button, and dragging the legend to a new location.



Legends can be added to graphs after they are created.


Plus your NAME in GRAPH, TITLE, AND PRINT

Lesson 6 - Saving a Graph

When you have completed the graph in the plot window, you can save the graph to a **Grapher** file [.GRF] or a **Grapher** project file [.GPJ] containing all the information necessary to reproduce the graph. When you save a graph, all the scaling, formatting, and parameters for the graph are preserved in the file.

The difference between a [.GRF] file and a [.GPJ] file is that [.GPJ] files store data within the file and [.GRF] files save a link to the data but it does not store the data internally in the file. If a graph file needs to be sent to a colleague, for example, you would need to send the data file along with the [.GRF] file.

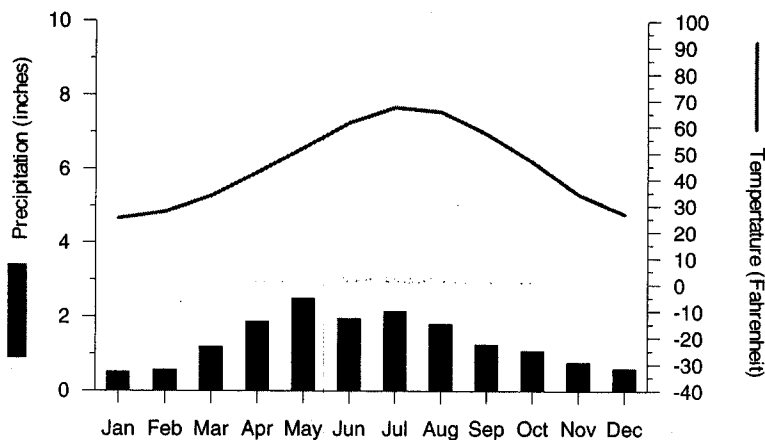
To save a graph:

1. Choose the **File | Save** command, or click the  button. The **Save As** dialog is displayed because the graph has not been previously saved.
2. In the *File name* box, type TUTOR.
3. In the *Save as type* list, select *Grapher File (*.GRF)* or *Grapher Project (*.GPJ)*.
4. Click *Save* and the file is saved to the current folder. The saved graph remains open and the **Grapher** title bar changes reflecting the changed name.

Lesson 7 - Graphing with Multiple Axes

This is an optional, advanced topic in **Grapher** that shows how to graph with multiple axes.

Sometimes, it is necessary to draw multiple graphs that share only one axis. One way this can be accomplished is using the **Graph | Add to Graph | Plot** command. Graphing with multiple axes requires several distinct steps that are discussed below.




In this graph, the bar chart uses the left Y axis and the line/scatter plot uses the right Y axis. Both graphs use the same X axis at the bottom of the graph.

Create the First Graph

The graph produced in this lesson contains a bar chart and a line/scatter plot, similar to the graph above. We will create the bar chart first, although this procedure works the same with any plot type.

To create the bar chart:

1. Open a new plot window with **File | New**. Select **Plot** in the **New** dialog and then click the OK button.
2. Select **Graph | 2D Graphs | Bar Chart** or click the  button.
3. Select TUTORIAL-BAR.DAT in the **Open Worksheet** dialog and then click the **Open** button. TUTORIAL-BAR.DAT is located in **Grapher's** SAMPLES folder.
4. In the bar chart properties dialog, set any properties you like and then click the OK button. The bar chart is created using X Axis 1 and Y Axis 1 as the axes.

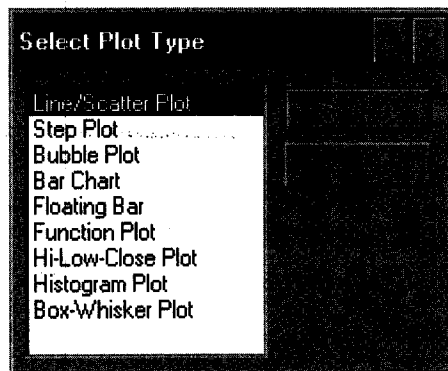
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Add a Plot to an Existing Graph

The second plot can be any type of plot listed in the **Select Plot Type** dialog. Since the first plot is a 2D bar chart, only 2D graphs can be added. 2D graphs cannot be combined with 3D graphs; Cartesian graphs cannot be added to polar graphs, etc.

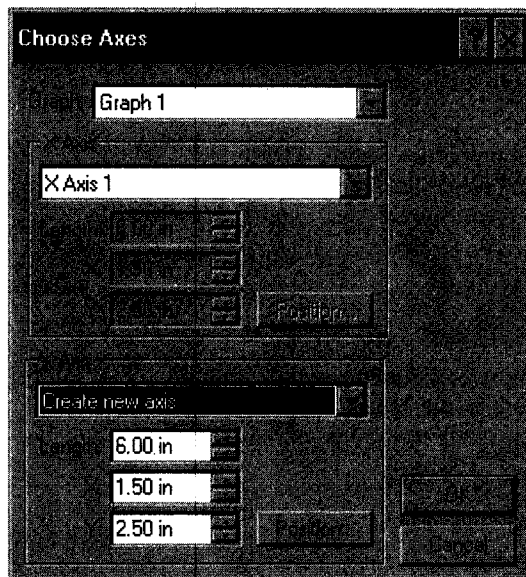
To add the line plot:

1. Select any part of the graph. You can use the **Object Manager** as in previous lessons, or you can click on one part of the graph.
2. Select **Graph | Add to Graph | Plot**.
3. Choose *Line/Scatter Plot* in the **Select Plot Type** dialog and click the OK button.



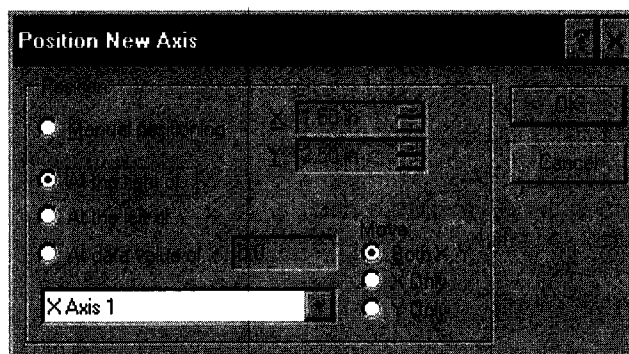
*When adding the second plot to the graph, select Line/Scatter Plot in the **Select Plot Type** dialog.*

4. In the **Choose Axes** dialog, select *X Axis 1* for the X axis, and select *Create new axis* for the Y axis. Click the down arrow in the Y Axis group to select *Create new axis*.



You can create new axes in the Choose Axes dialog.

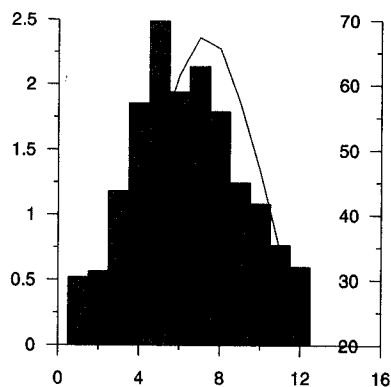
5. After *Create new axis* is selected, click the *Position* button.
6. In the **Position New Axis** dialog, position the new Y axis *At the right of X Axis 1* and click the OK button.



Position the new Y axis to the right of the X axis in the Position New Axis dialog.

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7. Click the OK button in the **Choose Axes** dialog.
8. Select TUTORIAL-LINE.DAT in the **Open Worksheet** dialog and then click the *Open* button. This data file does not need to be the same data file used in the first graph, although the X axis data range needs to be similar.
9. In the line/scatter plot properties dialog, set any properties you like and then click the OK button. The line/scatter plot is created using X Axis 1 and Y Axis 2 as the axes.





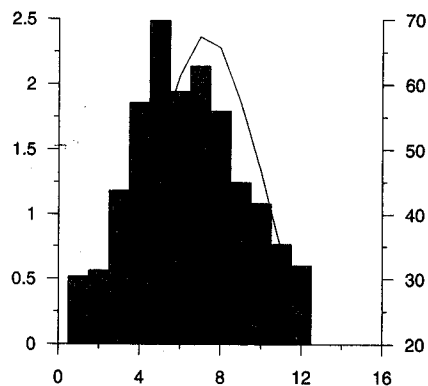
The bar chart uses the Y axis on the left and the line/scatter plot uses the Y axis on the right.

Adjusting the Axes

When creating multiple plots on a graph, you may want to alter the axes. In this example, the Y axis tick marks and labels would look better on the opposite side of the axis.

To move the tick marks and tick labels:

1. If the **Object Manager** is not already open, click **View | Style | Window w/Object Manager** or click the  button. This opens a list of all the objects in the plot window.
2. Click on the name *Y Axis 2* in the **Object Manager**.
3. Click the  button to open the axis properties dialog.
4. Click the *Position* button on the **Axis** page.
5. Check the *Flip tick marks and labels* box in the **Position Y Axis 2** dialog and then click the OK button.
6. Click OK or *Apply* in the axis properties dialog to move the tick marks and labels.

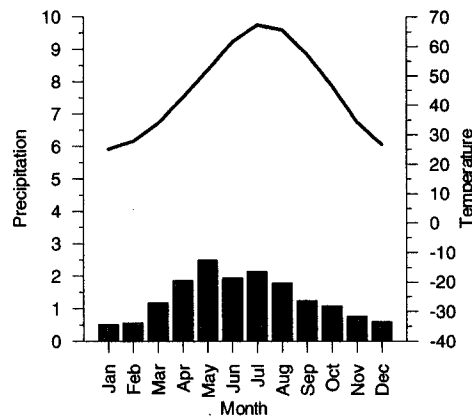


This is how your graph should appear after the tick marks and labels are moved.

Other Editing

You can also edit the other features of the graph, such as

- the tick mark spacing using the axis properties **Tick Marks** page
- the tick mark range in the *Axis Limits* group on the **Axis** page
- the axis titles on the axis properties **Axis** page
- the first and last major tick marks on the **Tick Marks** page
- the bar width in the bar chart properties dialog
- the line width in the line/scatter plot properties dialog



This graph was created using the additional editing suggestions.

In addition, you can edit more features, add a legend, and add a graph title. The graph on the right shows some of the additional editing listed above.

PUT YOUR NAME ON GRAPH AND PRINT
Need More Information?

If you find you still have questions after you have completed the tutorial, you should consider reviewing the material in the rest of the User's Guide or accessing **Grapher's** extensive online help. Usually, the answers to your questions are found in these locations. However, if you find you still have questions, do not hesitate to contact Golden Software's technical support. We are happy to answer your questions before they become problems.