



## Revealing the Secrets of Microsoft Project

*To know that one has a secret is to know half the secret itself*  
—Henry Ward Beecher

### Topics Covered in This Chapter

- Recognizing the Underlying Rules of Project
- Understanding the Project Data Structure
- Using Primary Project Data Fields
- Project Behavior and Definitions
- Navigating Project and Some Quick Tips
- The Major Project Views
- What Are Project Tables?
- Practice: Navigating and Using Project Views
- Summary

This chapter reveals most of the secrets of Project. If you have tried using the tool and do not know its secrets, you might think it has a mind of its own. Perhaps you have been frustrated when it changes the duration when you added a resource on a task. You might have entered work hours on a task, then find that Project changed the number of units (the percentage of the resource's assignment) a person is working on a task. This chapter describes the secrets up front, which many books on Project neglect to do. If you learn about the secrets immediately, you might be more likely to accept the methodology suggested in this book, or at least know that when you added the resource to the task why it changes the duration.

To help reveal the secrets, I first describe the Project data structure, the most important fields in the data structure, some of the rules and formulas that exist in the data structure that affect how the schedule behaves, some tips for using the tool efficiently, and some of the views you can use to see the

data in ways that allow you to understand Project’s behaviors. The beginning of the chapter is designed to introduce concepts, and is not meant as a guide to get around in Project. I then introduce simple navigation concepts. The chapter ends with practices to give you a feel for using the features and interfaces, called views, that expose the Project data structure and allow you to look at the data in various ways. You will not have a case study, as this is more about the features in the tool than the methodology of building a schedule.

## Recognizing the Underlying Rules of Project

As discussed in Chapter 1 “Introducing Microsoft Office Project” many people start using Project and expect it to act as a spreadsheet. They enter information on a task—such as a date in the Start field—which puts a constraint of “Start No Earlier Than” on the task as shown in Figure 2.1. The figure shows how a constraint is added as soon as a user typed in a date in the Start field (of 1/8/07). I define constraints in Chapter 4, “Understanding Task Information,” but for now, understand that just by typing in the date, the user caused a behavior in Project that many people don’t even notice until later when the schedule starts behaving in a way they don’t expect. Just by entering a start date, Project assumes that you now want to make sure that this particular task cannot start prior to the date you filled in, even if you later find out you could start it earlier.

Project icon indicating that a constraint has been added to the task

	Task Name	Duration	Start	Finish
1	Task 1	2 days	Mon 8/13/07	Tue 8/14/07

This task has a 'Start No Earlier Than' constraint on Mon 8/13/07.

Tool tip describing the constraint

**Figure 2.1** Constraint set by Project when you enter a date in the Start field

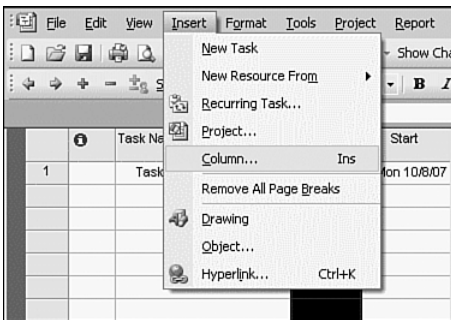
This behavior is part of the Microsoft Project scheduling engine, a very sophisticated set of rules about the way a schedule should behave, based on fundamental project management scheduling techniques. That’s why the tool is complex: The rules are not apparent. Project is an application that someone has programmed, and if you don’t understand some of the underlying programming, you might be dismayed by the tool’s behavior. I tell students



Finish date fields. Once you enter anything into a row (even a blank into the task name) in the view, you have created a row of data in the Project data structure for the task.

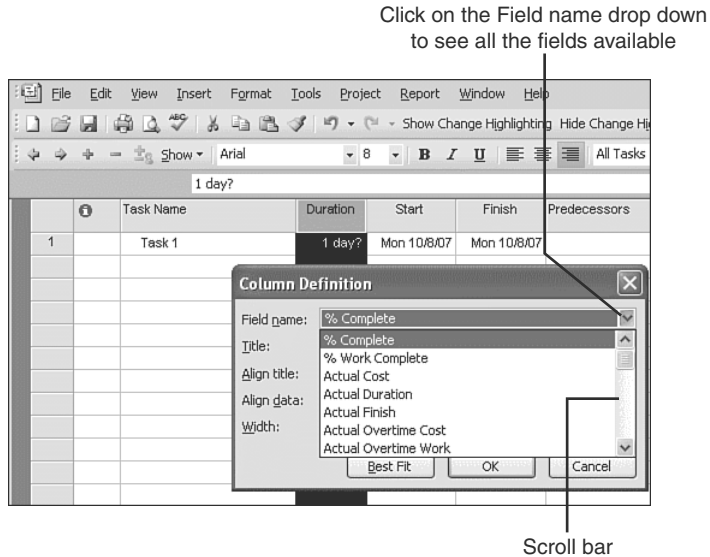
To understand that the row in the view contains more data than can be seen, you can expose more fields for the row than what is showing in the default Gantt Chart view. In Project, you will find the terms *column* and *field* used interchangeably. When you are inserting a column into any view, you are exposing a field from the Project data structure in the view you are displaying. For instance, to expose the % Complete field, you would perform the following steps:

1. Highlight a column (in this case, the Duration column). The column inserted will show up to the left of the column that you highlight.
2. Select Insert from the top menu bar and select Column from the drop-down list as shown in Figure 2.3.



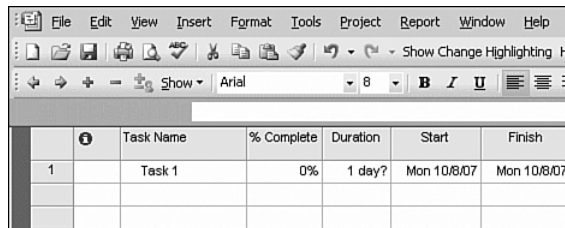
**Figure 2.3** Select Insert and Column to expose a data field for a task

3. The Column Definition dialog box displays as shown in Figure 2.4. Click the drop-down arrow for the box. Scroll up to find % Complete and select it by clicking it.



**Figure 2.4** Select % Complete from the Column Definition dialog box

4. Press OK, and the % Complete column will display to the left of the Duration column as shown in Figure 2.5.



**Figure 2.5** % Complete field now exposed in Gantt Chart view.

**You can select a field by typing the first character or characters of its name**

You can easily find a field in the Column Definition dialog box drop-down list by entering the first letter or character of its name. For instance, if you wanted to find the Work field quickly in the drop-down list, you can type “w” to take you to the beginning of all fields starting with “w.” If you type “wo,” Project will take you to the first field that begins with “wo,” which is “Work.”

You could insert column after column until you saw every field that is available to describe a task in Project. Figure 2.6 shows the % Complete, WBS, Priority, Actual Work, Work, Actual Duration, Actual Start, Actual Finish, Cost, and Actual Cost fields exposed for three tasks in the Gantt Chart. So when you are working with a task row, think about all of these fields, and many, many more actually existing in the task’s data structure, and that they could possibly have data in them even if you don’t see them in the view.

	% Complete	WBS	Task Name	Priority	Actual Work	Work	Actual Duration	Duration	Actual Start	Start	Actual Finish	Finish	Cost	Actual Cost
1	0%	1	Task 1	500	0 hrs	0 hrs	0 days	1 day?	NA	Mon 10/9/06	NA	Mon 10/9/06	\$0.00	\$0.00
2	0%	2	Task 2	500	0 hrs	0 hrs	0 days	1 day?	NA	Mon 10/9/06	NA	Mon 10/9/06	\$0.00	\$0.00
3	0%	3	Task 3	500	0 hrs	0 hrs	0 days	1 day?	NA	Mon 10/9/06	NA	Mon 10/9/06	\$0.00	\$0.00

**Figure 2.6** Several fields exposed from the data structure in the Gantt Chart

Notice that each task has been given a number on the far left side and there is data in the fields for each task. All the exposed fields have been populated with calculated or default data. There are hundreds of fields that are available to describe a task in Project. Some are fields just like you see in Figure 2.6, with defaults, formulas, or calculations. See “Using Primary Project Data Fields” later in this chapter to learn more about formulas or calculations in some of the most important fields of Project. Other fields are empty and you can customize how you will use them. In Figure 2.7, the field called Text1 in the Gantt Chart view allows you to enter any kind of text you would like to enter to describe the task.

The screenshot shows the Microsoft Project interface. The menu bar includes File, Edit, View, Insert, Format, Tools, Project, Report, Window, and Help. The toolbar contains various icons for file operations and project management. The status bar at the bottom shows 'All Tasks' and 'Yes'. The main window displays a task list with the following columns: Task Name, Text 1, Duration, Start, Finish, Predecessors, Resc, and a calendar view for Oct 8, '06. The 'Text 1' column is highlighted, indicating it is selected for customization.

	Task Name	Text 1	Duration	Start	Finish	Predecessors	Resc	Oct 8, '06
1	Task 1	This is a field I can use for customization.	1 day?	Mon 10/9/06	Mon 10/9/06			S S M T W T F

**Figure 2.7** *Text1 field (column) added to view for customized data.*

### As a general rule, don't copy rows into other schedules

As a general rule, unless you know exactly what you are doing, it is not a good idea to copy a row or rows from one project schedule to another. Now that you know Project has more than 100 fields for each task, consider that you might unknowingly be copying data from one schedule to another. As an example, if you enter 50% Complete on a task, a value is entered into the Actual Duration field. If another user copies your task row with a series of other tasks that she wants to duplicate in her schedule, she has just copied the Actual Duration into her schedule.

If you want to remove the column (also known as hiding the column) you entered into a view, you can simply highlight the entire column by selecting the column header, and press Del on the keyboard. You aren't really deleting the field from the data structure—you are merely hiding the column from the view. If you highlight a column and right-click it, you will see a drop-down list as well and see (among others) two options that allow you to Insert column or Delete column.

## Tasks, Resources, and Assignments in the Project Data Structure

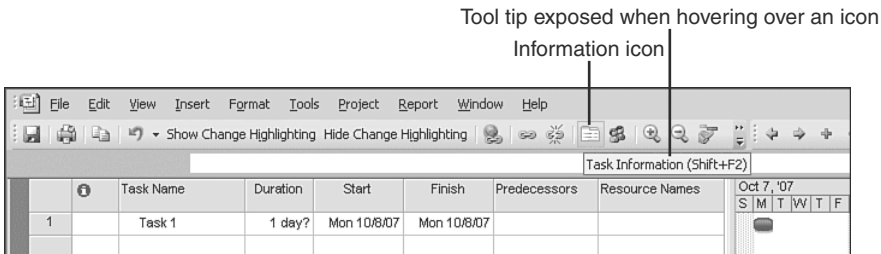
There is another concept to understand about the Project data structure. The data, in general, is structured according to these categories: tasks, resources, and assignments.

- Tasks are the activities in the schedule. You must have tasks to build a schedule. See Chapter 3 “Building Your Schedule: Scoping Your Project” for more about creating and managing tasks in the schedule.

- Resources are the people, equipment, or materials available to you to perform the work on your project. Project 2007 has introduced two new kinds of resources to help you calculate costs: cost and budget resources. Although not resources in the strictest sense, they will help you include cost and budget estimates on a project. See Chapter 6 “Understanding Resources and Their Effects on Tasks” for more about creating and managing resources in the schedule.
- Assignments are specific resources assigned to specific tasks. See Chapter 6 for more about creating and managing assignments in the schedule.

Some of Project’s most important views are designed based on the idea that each of these categories has particular kinds of data that are typically associated with it. For instance, tasks can have a duration but resources can’t. You cannot add the Duration field in a view that is designed to describe resource information. An assignment is a resource or resources added on a task so assignment views will contain data about the resource’s work on the task. Project also has settings that affect how each of these categories will behave. The following example illustrates how each category is associated with views in Project.

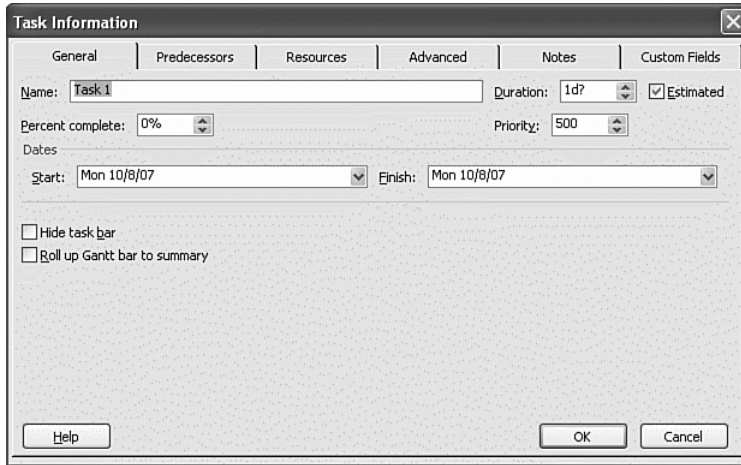
The Gantt Chart view is designed as an interface into the task data structure of the Project for you to enter information about the task. In Figure 2.8 you see a row for a task (Task 1) in the Gantt Chart view. If you hover over the Information icon (it looks like a file folder), a tool tip called Task Information appears.



**Figure 2.8** Icon selected showing Task Information

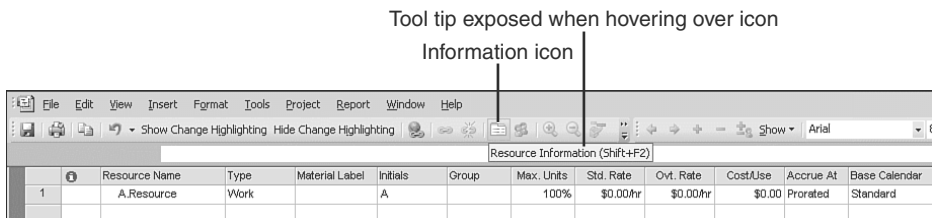


When you click on the icon, the Task Information dialog box displays, as shown in Figure 2.9. You can enter or review more information about a task than what is available in the Gantt Chart view. However, there are many more fields in the data structure relating to tasks. You could also insert any of the fields showing in the Task Information dialog box in the Gantt Chart view.



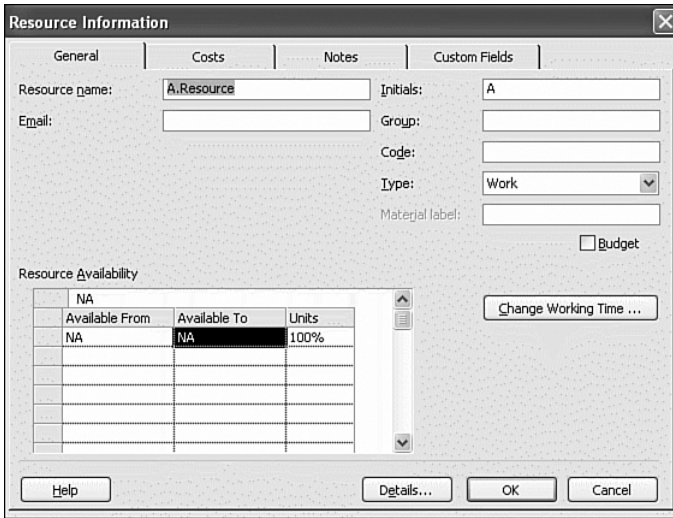
**Figure 2.9** Task Information dialog box

The main view for entering information about resources is called the Resource Sheet. This view's main function is to describe the major attribute of the resources on your project. Notice that the exact same Information icon shown in Figure 2.9 is shown in this resource view. However, if you hover over the same icon, the tool tip displays Resource Information as shown in Figure 2.10.



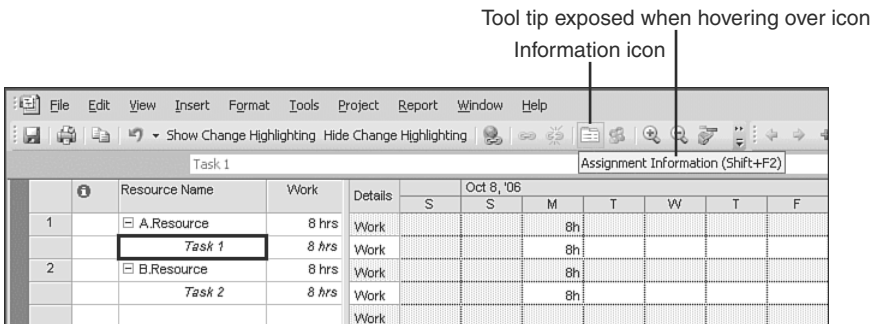
**Figure 2.10** Icon selected showing Resource Information

If you click on the icon, you will see the Resource Information dialog box, as shown in Figure 2.11. This dialog box allows you to enter or review additional data about a resource that does not display in the Resource Sheet view.



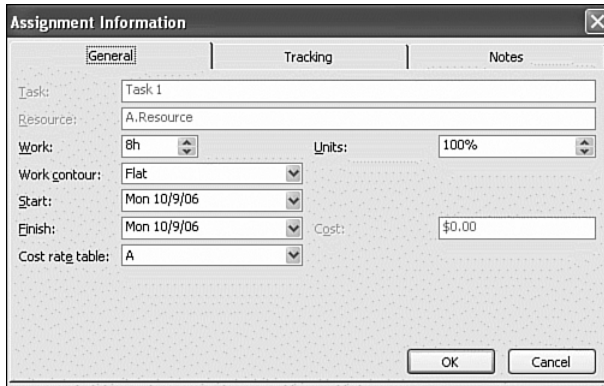
**Figure 2.11** Resource Information dialog box

One of the major views for reviewing information about assignments is the Resource Usage view. This view's main function is to show how the work is assigned to the task once you have assigned a resource to the task. Once again, the Information icon looks the same as that used for tasks and resources, but it is associated with the assignment as shown in Figure 2.12.



**Figure 2.12** Icon selected showing assignment information

As you can see, when you click on the icon, the Assignment Information dialog box displays as shown in Figure 2.13. Once again, the Assignment Information dialog box displays much more information about the assignment than is shown in the Resource Usage view, but there is more data not displayed in that view as well.



**Figure 2.13** Assignment Information dialog box

In summary, Project is designed to capture and display information about tasks, resources, and assignments. Data is associated with each of these categories of data, and there are fields that describe these categories of data and settings that affect them.

## Using Primary Project Data Fields

In the previous section, I described the categories the Project data structure uses, and in this section, I describe some of the most important fields and settings in Project. At times, you can have fields (e.g., Work) that are associated with each kind of category. For instance, Work can be associated with the following:

- A task to indicate the total number of hours expected for the effort of the task.
- A resource to indicate the total number of hours the resource will work on all tasks in a project.

- An assignment to indicate the total number of hours a particular resource will work on just his or her portion of the task on a project. For instance, the task's work might be 40 hours, but Resource A has an assignment for 20 work hours, and Resource B has an assignment for 20 work hours.

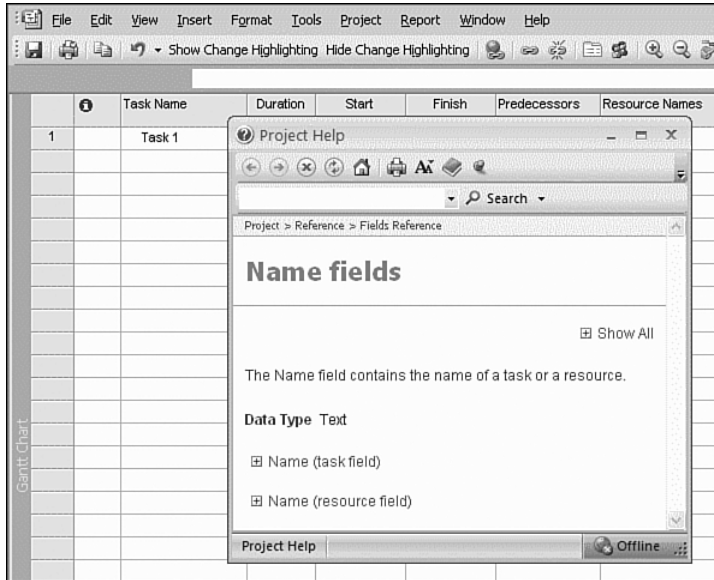
Remember that Column Definition dialog box you saw earlier when you inserted a column into a view? If you scrolled through it, you saw hundreds of fields that are available to you to describe a task (or a resource in a resource view). I don't know any book that describes every field. If this book did, it would probably be hundreds of pages longer than it is. However, there are fields in Project that are extremely important to scheduling and how Project works that are worth describing.

### Use Project Help to learn more about the fields you see

When you don't understand a field you can use Project Help to understand what it means. You can hover your cursor over any column displaying. You will see the name of the field and a hyperlink for Help, as shown in Figure 2.14. Click the hyperlink to open the Project Help dialog box for the particular field as shown in Figure 2.15. You might want to insert a column to check help for it. The help information might be slightly different in each version of Project, but this feature works the same in all of them.

	Task Name	Duration	Start	Finish	Predecessors
1	Task Name (Name) Help on Name	1 day?	Mon 10/8/07	Mon 10/8/07	

**Figure 2.14** Tool tip on Task Name that allows you to select help



**Figure 2.15** Help dialog box in Project 2007 that describes the task Name field

What fields are important to understand, as there are so many available? The following fields are important to scheduling and budget information produced by Project (the fields are exposed in Figure 2.16 so you can see how they look in a project).

- **Work:** The amount of time or effort scheduled on a task or for an assignment. In the following example, work is 80 hours for both Task 1 and Task 3.
- **Duration:** Total span of time to be expended on a task, from start to end date of the task. This differs from work significantly. For instance, a task might be scheduled to start on 10/8/07 and end on 10/19/07, for a total duration of 10 days. However, the amount of work or effort for someone to complete the task may only be 40 hours. In the following example, the duration is 10 days for both Task 1 and Task 3.
- **Cost:** Amount of dollars or other currency that might be expended in performing the task. Cost in the following example is \$8,000 for both Task 1 and Task 3. This was calculated by Project, which calculated the per hour rate of the resources on the task. You can't see the rate in this view, but the resources have been assigned a rate of \$100 per hour.

There are many interesting nuances about cost, especially actual cost. See Chapter 7 “Using Project to Enter Cost Estimates” for more information on costs.

- **Start:** Date the task and resource assignments for the task would begin. Start date for Task 1 in the following example is Monday, 10/8/07.
- **Finish:** Date the task and resource assignments for the task would end. The Finish date for Task 1 in the following example is Friday, 10/19/07.
- **Predecessors:** Task or tasks (shown by ID number) that come before a task can start or finish. The predecessor for Task 2 is Task 1 and the predecessor for Task 3 is Task 2 in the following example. Of course, the first task does not have any task coming before it, so it has no predecessor.
- **Successors:** Task or tasks (shown by ID number) that start or finish after a task starts or finishes. The successor for Task 1 is Task 2 and the successor for Task 2 is Task 3. Of course, the last task does not have any task coming after it, so it has no successor. See Chapter 5 “Sequencing the Work: Creating the Critical Path” to understand the many ways to set up relationships between tasks.
- **Units (amount available for a resource to be assigned to a task):** The percentage or amount of units a resource (or resources) is available to work on a task or tasks. In other words, if a resource is set to be able to work at 50% units, the resource can only expend half its capacity on the task. In the following example, for Task 1 in the Resource name field, Resource A is set at 50% units, and Resource B is also set at 50% units (shown in brackets after the resource name). On Task 3, the resource shows nothing after it, which means that Resource A is set at the default of 100% units on the task.

### **Field definitions vary based on what data field you are displaying**

The definition of a field can differ depending on what portion of Project you are reviewing. For instance, Work in the Gantt Chart is the total amount of time (effort) it will take to complete the task. Work on the Resource Sheet for a project is the total amount of work the resource has been assigned on all tasks in the project.



**Figure 2.16** Important Project fields exposed

Although there are numerous other fields in Project, the preceding fields are some of the most important in understanding the scheduling and cost calculations in the scheduling engine. There are other fields that set how the fields react. Although each of the following fields is described briefly here, each is also described in far more detail in later chapters. Some of the most important of these field settings are the following:

- Effort-driven:** This setting drives the task duration when resources are added or removed from a task. If the effort-driven field is set to Yes, (which is the default setting), then when resources are added to a task, they will share the work assigned to that task. The Work field will stay at the present value, even if you continue to add resources to the task. For instance, let's say the Work field is set at 50 hours and the Duration is initially 10 days. If you assign 5 people to the task, Project will set each resource to work 10 hours (it assumes an even sharing of the work unless you tell it otherwise). The duration of that task will be reduced to 2 days because, in essence, the work is shared between the resources and will take only 1/5 as long in calendar days if one person were working on the task alone. If this is set to No, then no matter how many people are assigned to the task, the duration will not change because the work will not be shared among the resources.
- Task Type:** There are three settings for this field: Fixed Units, Fixed Duration, and Fixed Work. This setting affects a calculation, Work equals Duration times Units, that sits in the scheduling engine. The data in one field might change based on a change in one of the other two fields. This is a very important setting that I discuss later in this chapter and in more detail in Chapters 4 and 6. The default Task type setting is Fixed Units. The Task Type and Effort-driven fields work together to affect how duration is affected on a task.
- Constraint Type:** There are eight settings that define how constraints are set for dates in Project. The constraints describe how you want to constrain or set the start or finish dates for a task:

- As Soon As Possible
- As Late As Possible
- Finish No Earlier Than
- Finish No Later Than
- Must Start On
- Must Finish On
- Start No Earlier Than
- Start No Later Than

If you select one of these settings and indicate a particular start or finish date, then the schedule will react accordingly. I discuss this more in Chapter 4 but for now think about this as telling the schedule exactly when you want the task to start or end.

- **Work Contour:** This is how work will be scheduled day-by-day. The default contour is Flat, which indicates you want Project to schedule work evenly over the duration of a task. See Figure 2.17, which shows how a resource is assigned to work on a 5-day, 40-hour task. Project applies the resource’s time on a Flat contour, scheduling the resource at 8 hours a day. If the resource were assigned to work on a 5-day, 20-hour task, Project would schedule the resource at 4 hours a day. There are many alternative contours available, such as front- or back-loaded. but most people only use or need to use the Flat contour. In this book, I do not cover the alternative contours available.

	i	Resource Name	Work	Details	Oct 7, '07						
					S	M	T	W	T	F	S
1		Resource A	40 hrs	Work		8h	8h	8h	8h	8h	
		Task 1	40 hrs	Work		8h	8h	8h	8h	8h	

**Figure 2.17** How Project scheduled time day-by-day using a Flat contour

- **Timephased:** Data within Project can be shown in a timephased format. Project distributes the cost, allocation, and work information for tasks, resources, or assignments across time. Even though you might enter Duration as being 20 days, when a resource is added to the task, Project distributes the work to be performed over months, weeks, days, hours, and minutes, which is accessible in the Project data structure. Figures 2.18 through 2.23 illustrate this timephased distribution



in the Project data structure in the Resource Usage view. The only thing that has changed in each view is the timescale so that the timephasing is exposed. Depending on the length of your project, you might find a week-by-week timephased view to be the right level of detail. However, some people use Project to schedule critical operational maintenance projects that requires an hour-by-hour or minute-by-minute schedule, and the detailed timephased view might be appropriate.

	i	Resource Name	Work	Details	Qtr 4, 2007	
					Oct	Nov
1		<input type="checkbox"/> Resource A	80 hrs	Work	80h	
				Cost	\$8,000.00	
		Task	80 hrs	Work	80h	
				Cost	\$8,000.00	

**Figure 2.18** Timephased data by month

	i	Resource Name	Work	Details	Oct '07			
					30	7	14	21
1		<input type="checkbox"/> Resource A	80 hrs	Work		40h		40h
				Cost		\$4,000.00		\$4,000.00
		Task	80 hrs	Work		40h		40h
				Cost		\$4,000.00		\$4,000.00

**Figure 2.19** Timephased data by week

	i	Resource Name	Work	Details	M	T	W	T	F
					1		<input type="checkbox"/> Resource A	80 hrs	Work
				Cost	\$800.00	\$800.00	\$800.00	\$800.00	\$800.00
		Task	80 hrs	Work	8h	8h	8h	8h	8h
				Cost	\$800.00	\$800.00	\$800.00	\$800.00	\$800.00

**Figure 2.20** Timephased data by day

	i	Resource Name	Work	Details	Mon Oct 8			Tue Oct 9			
					12 AM	6 AM	12 PM	6 PM	12 AM	6 AM	12 PM
1		<input type="checkbox"/> Resource A	80 hrs	Work		4h	4h			4h	4h
				Cost		\$400.00	\$400.00			\$400.00	\$400.00
		Task	80 hrs	Work		4h	4h			4h	4h
				Cost		\$400.00	\$400.00			\$400.00	\$400.00

**Figure 2.21** Timephased data by hour (by half day)

1	Resource Name	Work	Details	8 AM	10 AM	12 PM	2 PM	4 PM
				Resource A	80 hrs	Work	2h	2h
			Cost	\$200.00	\$200.00	\$100.00	\$200.00	\$100.00
	Task	80 hrs	Work	2h	2h	1h	2h	1h
			Cost	\$200.00	\$200.00	\$100.00	\$200.00	\$100.00

**Figure 2.22** Hourly timephased data (2-hour increments)

1	Resource Name	Work	Details	Wed Oct 10, 8 AM				Wed Oct 10, 9 AM				Wed Oct 10, 10 AM		
				0	15	30	45	0	15	30	45	0	15	
	Resource A	80 hrs	Work	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h
			Cost	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00
	Task	80 hrs	Work	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h	0.25h
			Cost	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00	\$25.00

**Figure 2.23** Timephased data by minutes.

New users of Project are sometimes confused by what the Work, Duration, Start, Finish, and Cost fields really mean. As an example, the Work field is actually the current estimate for the work at completion. You might have originally estimated a task would take 40 hours, but as you enter progress during the execution of the project, the Work field might change to indicate that currently, the estimate is 50 hours (based on progress reported by the resource completing the task). The following terms can designate the Work, Duration, Start, Finish, and Cost fields:

- Current:** The current value for the data element which indicates what will be accomplished at completion of the project. This term does not appear in front of the data fields. For instance, when you see the data in the Work, Duration, Start, Finish, or Cost fields, they contain values that indicate what will happen if the current course of action continues. The Baseline field is the real estimate, not one of the Work or Duration field. Once you start tracking, the fields contain the current estimated values, based on recording the Actual and Remaining field values.
- Actual:** The data value based on what actually happens when you enter data to track your project progress. For instance, the planned Duration field might be 10 days, but when you ask the team members how long it really took to get the work done, they tell you 12 days. You would enter 12 in the Actual duration field. What is perplexing (until you know better) is that when you enter 12 in the Actual duration field, the current duration field will change to 12, too. This is because of a formula described in the next section of this chapter. If you use the baseline field described next, you don't have to worry about this phenomenon.

- **Baseline:** The data value in the field based on your recording of the planned fields at a point in time. When you are satisfied with the estimates in the planned Duration and Work fields, you can perform an action that baselines the schedule. This captures a record of those planned values. Then, when you enter actual values into a field, you can see the variance between your original planned estimates and the actual values. For instance, if your planned Duration is 10 and you baseline the schedule, Baseline Duration is entered with 10. Once you record an Actual Duration value of 12, the Duration field will change to 12, but the Baseline Duration field will remain at 10 so you know what your original estimate was.
- **Remaining:** This designation in front of a field indicates how much is remaining in the planned estimate when an actual value is applied. For instance, let's say you have a planned Duration of 10 days. You apply an Actual Duration of 2 days. That means the Remaining Duration is 8 days.

See Figure 2.24 to illustrate this concept. Your planned duration estimate for a task was 10 days. Let's say your team tells you they have completed 2 days on the task. You enter the information in the Actual Duration field as shown. Notice that the Remaining Duration field displays 8 days.

	Task Name	Duration	Actual Duration	Baseline Duration	Remaining Duration	Oct 7, '07							Oct 14, '07						
						S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	Task 1	10 days	2 days	10 days	8 days														

**Figure 2.24** Duration fields exposed for a task with 2 days actual progress reported

Then, 10 days later, the team tells you they are actually done, and it took a total of 12 days. Figure 2-25 shows what this would look like in the fields. Notice that the Duration field is 12 days, the Remaining Duration field is 0, and the Baseline Duration field is the only one that shows the original estimate of 10 days.

ID	Task Name	Duration	Actual Duration	Baseline Duration	Remaining Duration	Gantt Chart						
						Oct 7, '07	Oct 14, '07	Oct 21, '07	S	M	T	W
1	✓ Task 1	12 days	12 days	10 days	0 days							

**Figure 2.25** Duration fields reflecting values after actual progress is entered on the schedule

Table 2.1 shows the various designations for schedule and budget fields.

**Table 2.1** Various Field Designations

Current	Actual	Baseline	Remaining
Work	Actual work	Baseline work	Remaining work
Duration	Actual duration	Baseline duration	Remaining duration
Cost	Actual cost	Baseline cost	Remaining cost
Start	Actual start	Baseline start	Not applicable
Finish	Actual finish	Baseline finish	Not applicable

Keep these fields in mind as you schedule tasks and review actual progress for costs, work, and duration of tasks in the schedule.

## Project Behavior and Definitions

Not only does Project have a data structure around task, resource, and assignment categories and fields that are core to the way project scheduling works, Project also uses formulas, calculations, and rules that affect scheduling behavior. You cannot see these formulas, calculations, and rules, except in the behavior of Project itself. In this section, I describe some of the behaviors, but this by no means is all-encompassing.

### Scheduling

Project uses particular settings, fields, and formulas when scheduling based on the information you enter. First and foremost, the calculations occur to the schedule because by default Project is set to automatically calculate scheduling changes. This setting can be turned off by selecting Tools from the menu bar, then clicking Options and setting the Calculation mode to

manual on the Calculation tab. Experienced schedulers, or those familiar with other scheduling systems, sometimes turn the setting off, but you should leave it on initially to learn how it works.

The most important calculation in Project is this:

$$\text{Duration} \times \text{Units} = \text{Work}$$

also known as

$$\text{Work}/\text{Units} = \text{Duration}$$

or

$$\text{Work}/\text{Duration} = \text{Units}$$

The calculation and its result are easier to remember if you keep in mind that units refers to resources (1 resource at 100% allocation is 1 unit).

Figure 2.26 shows the result of this formula for a task in Project. Work has been inserted as a column in the Gantt Chart view and the columns have been moved to better reflect the formula.

	<b>i</b>	Task Name	Duration	Resource Names	Work	Oct 7, '07	Oct 8, '07
						S	M
						T	W
						T	F
						F	S
						S	S
1		Task Formula	5 days	R1	40 hrs	R1	

**Figure 2.26**  $\text{Duration} \times \text{Units} = \text{Work}$

The task has a Duration value of 5 days (with a day being set at 8 hours). One resource (R1) is assigned at 100% (1 unit) on the task, meaning the resource is set to spend 100% of an 8-hour day on the task. If you assign another resource to the task, two units (200%) are assigned to work on the 40-hour task. The result is shown in Figure 2.27.

	<b>i</b>	Task Name	Duration	Resource Names	Work	Oct 7, '07	Oct 8, '07
						S	M
						T	W
						T	F
						F	S
						S	S
1		Task Formula	2.5 days	R1,R2	40 hrs	R1,R2	

**Figure 2.27**  $\text{Duration} \times \text{Units} = \text{Work}$  and another unit (resource) added

Project assumes that the two resources will share the work. The best way to illustrate this is changing the formula around a bit.

$$\text{Work/Units} = \text{Duration. } 40/2 = 20 \text{ hours} = 2.5 \text{ days duration}$$

Project calculates based on fractional hours and minutes and converts the hours into duration. The calculations used are also based on project and resource calendars in Project (which you can customize). Chapters 4 and 6 describe the formula and how it uses calendars and other settings extensively. When you think you have set a duration, resources, and work, and you change the data in any one of those fields, the formula kicks in and most likely you will see Project calculate something new in one of the other fields that you didn't quite expect (unless you know about the formula and associated settings, such as the effort-driven flag and Task types as described in the earlier section "Using Primary Project Data Fields").

Remember planned (also known as current), remaining, and actual designations to the Work, and Duration fields? They are actually parameters in a formula:

$$\text{Actual Work} + \text{Remaining Work} = \text{Work}$$

and

$$\text{Actual Duration} + \text{Remaining Duration} = \text{Duration}$$

Although this formula was covered earlier in this section for work, let's take another look at the formula using Duration. If Duration is 10 days, and a resource worked 6 days, then the Remaining Duration is 4 days as shown in Figure 2.28.

	Task Name	Duration	Actual Duration	Remaining Duration	Start	Finish	Gantt Chart						
1	Duration Task	10 days	6 days	4 days	Mon 1/8/07	Fri 1/19/07							

**Figure 2.28** *Duration = Actual Duration + Remaining Duration*

The Remaining Duration is your estimate to complete (ETC) information. When you start capturing actual data values for your schedule, and you find that you need to increase or decrease your original plan's Duration or Work values, it is best practice to change the Remaining duration or Work field, rather than changing the Duration or Work field. Let's say that after you enter the 6 actual days of duration, you ask the resource performing the

work how much time is left to finish the work. She says 6 more days. It would be tempting to add the 6 days to the Duration field, but notice what happens, as shown in Figure 2.29.

	Task Name	Duration	Actual Duration	Remaining Duration	Start	Finish	Gantt Chart			
1	Duration Task	16 days	6 days	10 days	Mon 1/8/07	Mon 1/29/07	[Gantt bar from Mon 1/8/07 to Mon 1/29/07]			

**Figure 2.29** Adding 6 days to the Duration field increases the estimate and shows Remaining Duration at 10 days.

If you enter the remaining work of 6 days in Duration, Project increases the duration to 16 days, but what you really meant is that it is 6 days past the Actual Duration value of 6. To avoid this issue, it's best to use the Remaining Duration (or Work) field. If you enter 6 in the Remaining Duration field based on Figure 2.28, the Duration field is automatically adjusted as shown in Figure 2.30. Remember if you use Baseline Duration you'll always have the original estimate of 10 days available.

	Task Name	Duration	Actual Duration	Remaining Duration	Start	Finish	Gantt Chart			
1	Duration Task	12 days	6 days	6 days	Mon 1/8/07	Tue 1/23/07	[Gantt bar from Mon 1/8/07 to Tue 1/23/07]			

**Figure 2.30** Changing the Remaining Duration value to 6 days changes the Duration field for the proper new estimate

Dates are also part of the scheduling engine. The following formula helps you understand how the finish or start dates are set when you enter a value in the Duration field, or how, while entering schedule progress, entering dates in the Actual Finish or Actual Start fields could affect the value in the Duration field. The formula is:

Finish date - Start date = Duration (not including the nonworking days in your calendar)

Duration is the number of working days between the two dates. If you change the duration of a task while you are working on your schedule, the start and finish dates could change.

## Costs

Costs have certain rules, settings, and behaviors as well. By default, the Actual Cost field is calculated by Project, and you cannot enter data into that field directly, although you can change that setting. In general, Project expects you to have a resource on a task that is its basis for calculating a cost. Just as work and duration have a formula that includes actual and remaining data, so does cost. The formula for cost is:

$$\text{Actual Cost} + \text{Remaining Cost} = \text{Cost}$$

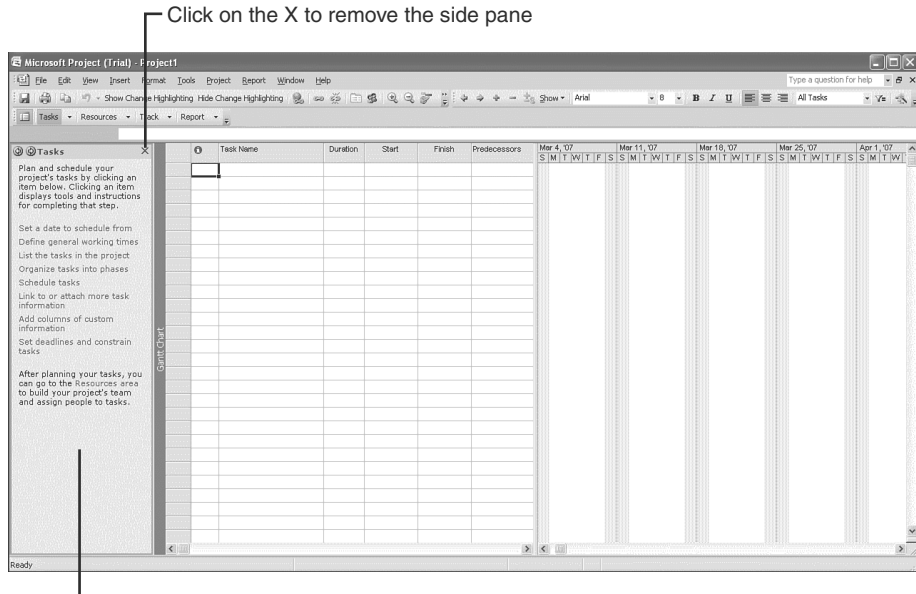
Let's take a look at this formula for costs. This example describes a nonlabor cost also known as a fixed cost. For this example, you might have budgeted for a server for your Information Technologies project. You have decided to use a line item (New Server Purchased) to estimate the cost and then record the actual cost when it comes in. You have been quoted \$2,500. When you enter \$2,500 in the Cost field, it immediately enters the same amount in the Remaining Cost field (and Actual Cost, of course, is 0). Now, let's say that you have to pay a down payment on the server about a month after you start the project. You enter 20% complete on the task to show that you have paid for some of the server as shown in Figure 2.31.

	i	% Complete	Task Name	Fixed Cost	Cost	Actual Cost	Remaining Cost	Oct 7, '07					Oct 14, '07									
								S	M	T	W	T	F	S	S	M	T	W	T	F	S	
1		20%	New Server Purchased	\$2,500.00	\$2,500.00	\$500.00	\$2,000.00															

**Figure 2.31** *Actual Cost + Remaining Cost = Cost*

Now let's say the server comes in. You can now enter 100% and the total Actual Cost will be reflected as the Cost and Project changes the Remaining cost field to 0 as shown in Figure 2.32. This is a very simple example of how planned, actual, and remaining fields work together in cost calculations. See Chapter 7 and Chapter 11 "Tracking Your Schedule" to understand more complex situations of entering and recording actual cost data into Project.





**Figure 2.32** Remaining Cost set to 0 after line item is 100% complete

### Project 2007 has a new cost resource

Nonlabor costs have been problematic in past versions of Project although the Fixed cost field could be used to indicate a nonlabor cost. Project 2007 introduces a new resource type called a cost resource. You can assign a cost resource on a task and it will behave entirely independent of the labor cost calculations and the duration or work on a task. See Chapter 7 for more about cost resources.

When adding resources to a task, the additional complexities of cost can be reflected in the following calculation:

$$\text{Standard rate of resource(s) assigned} \times \text{Work hours} = \text{Cost of a task}$$

As an example, Task 1 has an estimate of 50 hours of work. Resource A has been assigned to the task and Resource A's standard rate is \$100. Figure 2.33 shows Resource A's Std. Rate value in the Resource Sheet.

	❏	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar
1		Resource A	Work		R		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard

**Figure 2.33** Standard rate applied to a resource

Then Resource A is added to the task in the Gantt Chart view as shown in Figure 2.34. Based on a standard rate of \$100 × 50 hours, the cost of the task is \$5,000.

	❏	Task Name	Work	Duration	Cost	Start	Finish	Resource Names	Oct 7, '07							Oct 14, '07							Oct
									F	S	S	M	T	W	T	F	S	S	M	T	W	T	F
1		Cost Task	50 hrs	6.25 days?	\$5,000.00	Mon 10/8/07	Tue 10/16/07	Resource A															

**Figure 2.34** Rate × Work = Cost of the task

There are also calculations based on consumable resources, such as the price of gas per gallon, called material resources. See Chapter 7 for more information about material resources.

## Resources

Resources are the people, equipment, or materials that can be assigned to a task that ensure the task gets completed. To understand resources, it is useful to understand a few key terms: Units, Availability, and Overallocation. Although Project 2007 has introduced two new resources called Cost and Budget resources, this section focuses on the type of resources that are assigned to perform the work on a task.

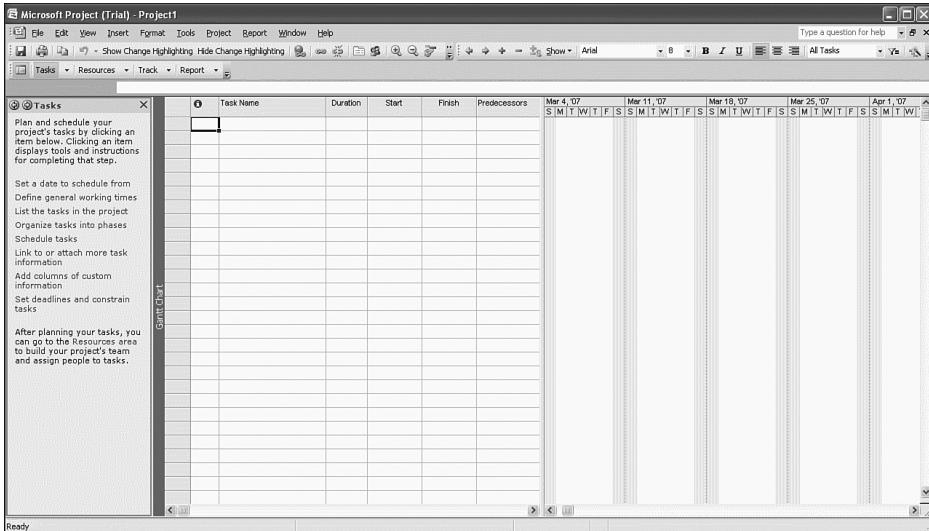
- **Units:** The amount of a resource's time that can be assigned to a task. Units can be expressed in percentages or decimals. If Resource A is assigned to work on a task at 75% units, he can work 75% on the task each day, calculated as 6.4 hours a day if his normal work day is set at 8 hours. 100% units would mean the resource could work full-time on the task.
- **Availability:** The amount of time a resource is available to work. Availability is a combination of a resource's calendar (the days she can work, and how many hours per day she can work), and how many

units of the resource is available for the project and the task. For instance, a resource might be set to be available to work for 40 hours a day, 5 days a week. The resource is assigned to a specific task at 40%. In this case, the resource is available for only 3.2 hours per day to work on the task (8 hours  $\times$  .40 = 3.2 hours).

- **Overallocation:** The amount of time a resource is set to work on projects beyond their availability. For instance, if a resource is available at 100% (and has a resource calendar set for 8-hour work days), but has been assigned two projects, the resource might be set to work 16 hours per day over the span of time during which the projects' tasks overlap. Project will show a resource as overallocated even if the scheduled work exceeds availability for only one minute. Also, Project will allow you to grossly overallocate resources because it doesn't know whether you are going to level the resources or not. Part of your job as a project manager is to level the work of the project so resources are not overallocated. See Chapter 9 "Reviewing Work Overload and the Critical Path" to learn more about overallocation.

## Navigating Project and Some Quick Tips

Once you know that there are a lot of fields, calculations, and settings in Project that affect the behavior of Project, understanding the Project interface will increase your efficiency in using the tool. In this section, I describe how you can get around in Project, and what some of the best views are. The first view you always see when you open up Project is the Gantt Chart view, shown in Figure 2.35. There is nothing else you have to do, other than click on the Project application (after installation) to get this initial screen.



**Figure 2.35** *The initial Gantt Chart view with the Project Guide side pane displaying*

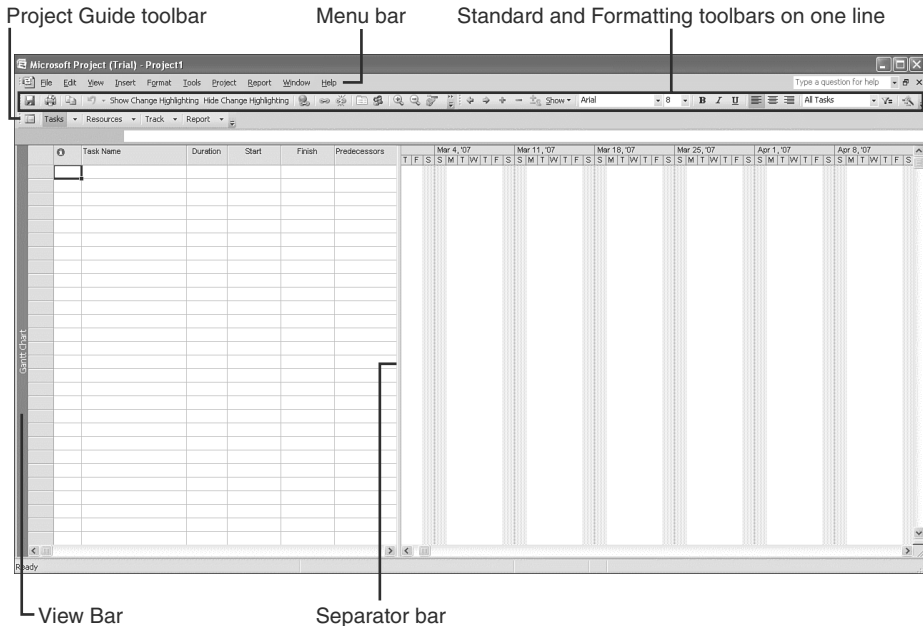
Figure 2.35 might be slightly different than your initial interface. You might have some different defaults already loaded, or if you have used Project before, your interface might be displaying some different icons or toolbars. Other Project versions aren't too much different; just the shape and coloring of the icons have changed from previous versions to Project 2007. From Project 2002 through Project 2007, the features and functions have not changed much.

The pane on the left side is the Project Guide. It loads by default when you first open Project 2007. The Project Guide was a feature added in Project 2002 and provides a step-by-step instruction for using Project. You might want to use it once you understand the overall methodology for building and tracking a project schedule and it will help support what you learn in this book. To learn more about the Project Guide, see Chapter 13 "Project Mysteries Resolved!"

You can remove the Project Guide side pane by clicking the X in the upper right corner of the pane as shown in Figure 2.35. In past versions of Project, you would also see a task pane which you could also remove by clicking an X in the upper right corner of the pane. You could also display the task pane by selecting File on the menu bar, then clicking New. Although these side panes can be useful to step you through particular tasks you perform in Project, in

this book I describe items on the interface with them removed, unless their functions are expressly used.

The menu bar, toolbars, and view bar that display on this view do not change as you move between views in Project. Figure 2.36 displays the standard navigation tools for Project.



**Figure 2.36** *Gantt Chart view with more room for entering and viewing data*

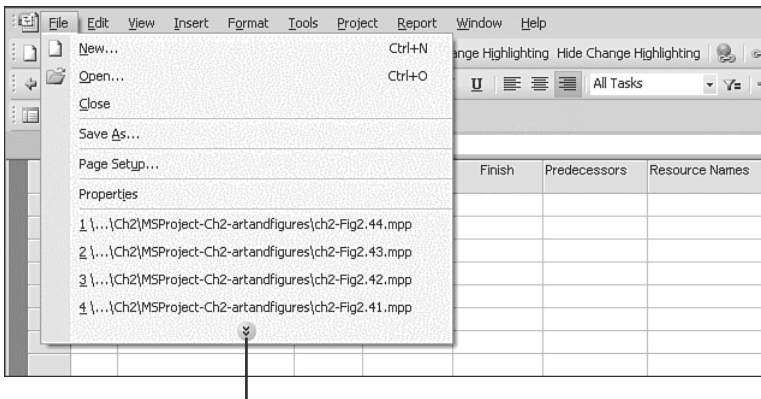
The menu bar allows you to select most any function you want to perform. When you click a function in the menu bar, a drop-down list displays to select a particular function. The Standard and Formatting toolbars contain icons that allow you to perform the most common functions of Project more easily than using the menu bar. Although you might have removed the Project Guide side pane, the toolbar for using it is still visible. This allows you to bring the Project Guide back easily if you'd like to use it. The view bar is the vertical strip on the far left of the view.

Although not a part of navigation, the separator bar is a common element on several views, and on the Gantt Chart view it distinguishes the task entry sheet area on the left side from the Gantt Chart bars on the right side of the

view. You enter the tasks in the entry sheet on the left, and can visually see the timescale on the right side to help with scheduling decisions. You can click and hold down the mouse on the separator bar and move it horizontally to display more task entry columns on the left side, or more Gantt Chart bars on the right side. You will see this separator bar on several views and you can move it on those views as well.

## Using the Menu Bar

You will use the selections from the top menu bar to perform the major functions in Project. You can click on the function at the top of the bar, such as File, as shown in Figure 2.37, and a drop-down list appears. Click the selection to perform the function listed. Depending on the function, sometimes the function is immediately performed and sometimes a dialog box or another selection appears for you to use to complete the function.

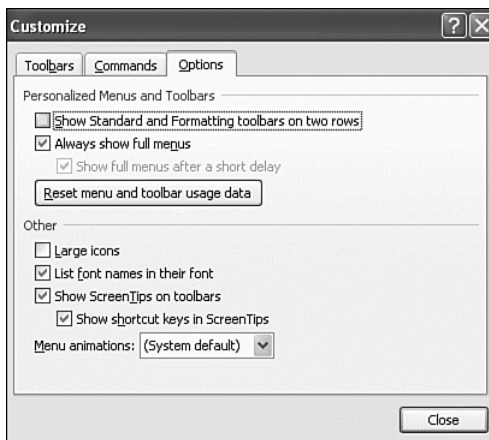


Arrows indicates there are more selections

**Figure 2.37** Drop-down list after selecting File on the menu bar

In Figure 2.37 notice the double arrows at the bottom of the drop-down list. As with all Microsoft Office applications, the double arrows at the bottom of the drop-down list indicate that there are more selections. If you are like me, you find it annoying that you can't see all the selections unless you wait a moment or two, or unless you click on the arrows. This book shows full menus. In case you have not been introduced to how to change this behavior follow these steps:

1. Select Tools from the menu bar and click Customize.
2. Click Toolbars.
3. The Customize dialog box appears, as shown in Figure 2.38. Select the Options tab.
4. Select the Always show full menus check box and click Close in the dialog box. Now when you click File in the menu bar, the full drop-down list displays.



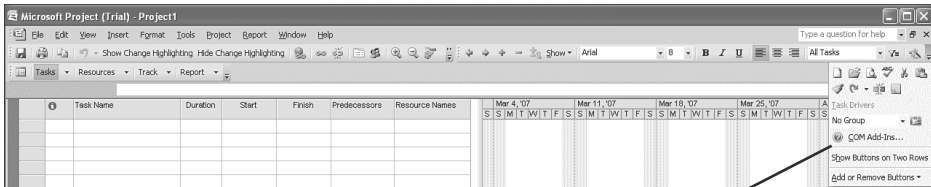
**Figure 2.38** Select the Always show full menus check box in the Customize dialog box

This book does not cover each selection in the menu bar unless it is a common function needed in building or tracking your schedule. However, this book uses the functions from the menu bar to describe how to perform Project steps. As with all Microsoft products you can right-click in a field or double-click to be more efficient in performing the same function, some of which is introduced in the course of this book.

## Using the Toolbars

The Formatting and Standard toolbars show by default and contain some of the most popular buttons (also called icons) for performing functions in Project. You also might not see all the possible buttons on the toolbars. In Figure 2.36, the majority of the buttons for the two toolbars show on one strip. You can see all the buttons or set the toolbars to two rows by selecting

the Toolbar Options button at the very far right of the toolbar, shown in Figure 2.39.



Shows buttons not visible and allows you to choose to display all buttons on two rows

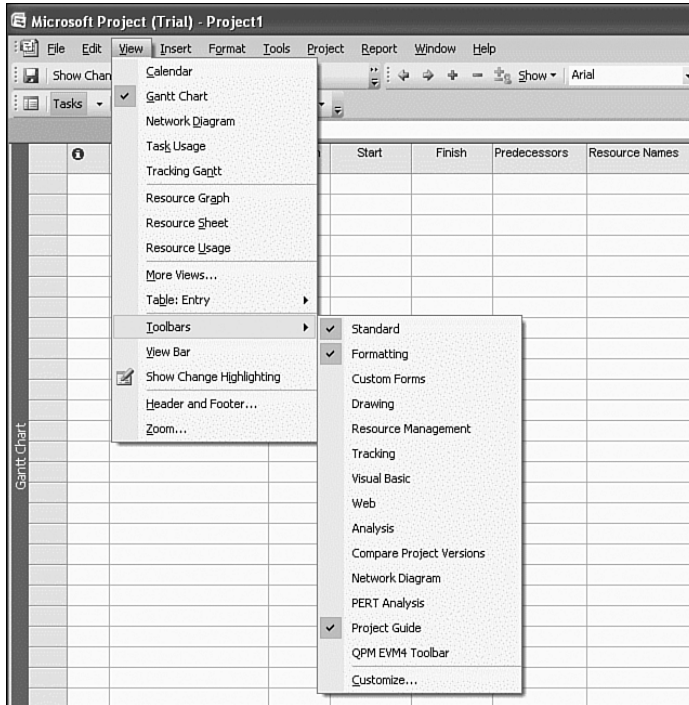
**Figure 2.39** *Show hidden buttons or buttons on two rows*

You can also add and remove toolbars, which can be very useful depending what you are doing in the schedule. If you are tracking your schedule, you can add the Tracking toolbar to perform some tracking functions more easily. You can also remove toolbars to gain more room in your view. For instance, the Project Guide toolbar displays by default, and you might want to remove it if you do not use it often.

To add or remove toolbars, follow these steps:

1. Select View from the menu bar, then click Toolbars.
2. The resulting drop-down list shows all the toolbars available for you to remove or add as shown in Figure 2.40. Notice that all toolbars displaying have a check mark next to them. To remove a toolbar, click it on this list and it will be removed. To add a toolbar, click it on this list, and the toolbar will be added.





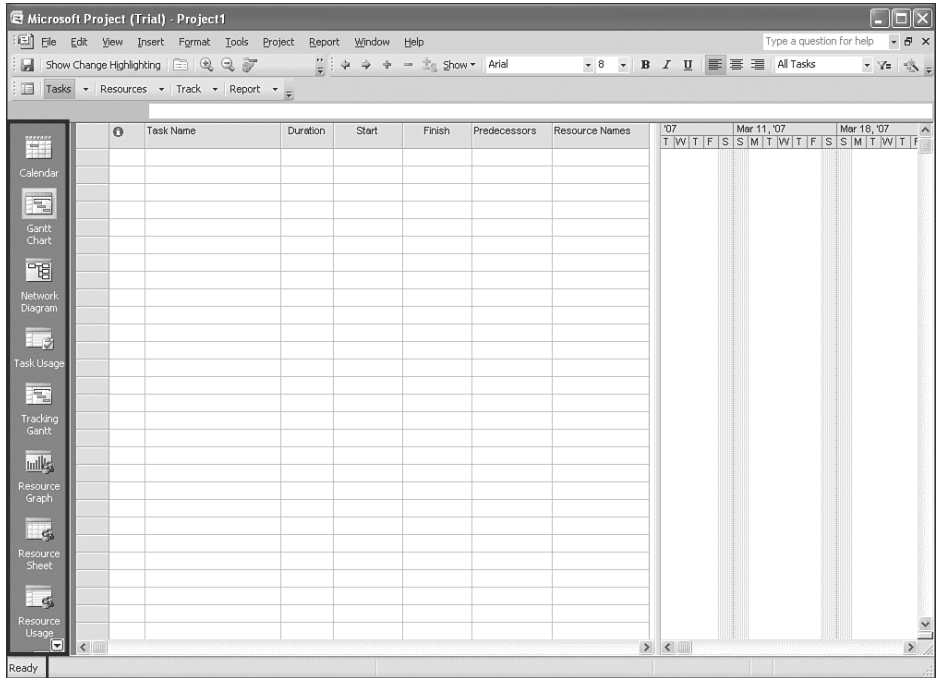
**Figure 2.40** Use the toolbar drop-down list to add or remove toolbars.

## Using the View Bar

You might have noticed the vertical strip on the left of the views of Project and sometimes people have that vertical strip set differently. When you first open your project schedule view, you might see a thin strip with Gantt Chart written vertically in it. You might also see a wider strip, with icons and view names listed in the strip, as shown in Figure 2.41. The View Bar displays the most popular views in Project.

To display the View Bar follow these steps:

1. Select View from the menu bar.
2. Near the bottom of the drop-down list, click View Bar. The View Bar will appear as shown in Figure 2.41.



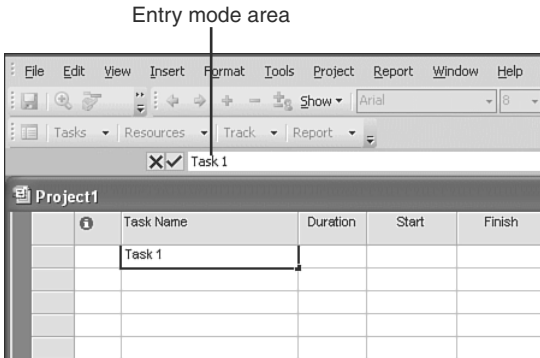
View Bar

**Figure 2.41** *The view bar*

To remove the View Bar, perform the same steps. Because the View Bar is selected, when you click View Bar again, it clears the option.

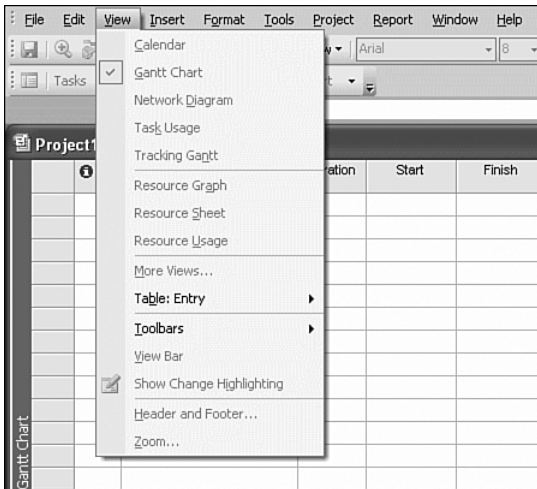
Why would you use or not use the View Bar? It's based on personal preference. If you use it, it takes up a bit more space on your desktop but it is easy to click and scroll between the various views. When you use it, it's a little harder to tell what view you are on, as the icons are shadowed. When you don't use the View Bar, you can easily see the name of your view as shown in Figure 2.36, where Gantt Chart is easily displayed in the vertical strip. If you prefer to leave the View Bar off of your interface, you can select View from the menu bar and see the same selections in a drop-down list, or right-click the view name you see, and select from the list there as shown in Figure 2.42.





**Figure 2.43** *Entry mode in Project*

Notice that the field still has a black highlight around it, and there is no data in the Duration, Start, or Finish fields. Also, you see an X and a check mark in the entry field above Task Name. If you were to go to the menu bar immediately to select a function from the File drop-down list, you would see something similar to what is shown in Figure 2.44.



**Figure 2.44** *Unavailable selections in gray while in entry mode.*

Most of the selections are unavailable in the drop down list. However, if you click out of the field into which you are entering data and into a new field, you will be able to select other functions in Project and the data you type



## The Split Window

The Split Window function in Project is very useful in providing you with additional information about tasks or resources in whatever view you have chosen. Initially, it might confuse new Project users because it does not simulate the split window function of other Microsoft products. It introduces a completely different window with different information than what is in the top window, unlike other Microsoft applications that simply split the same application information in two. To see the Project split window, follow these steps:

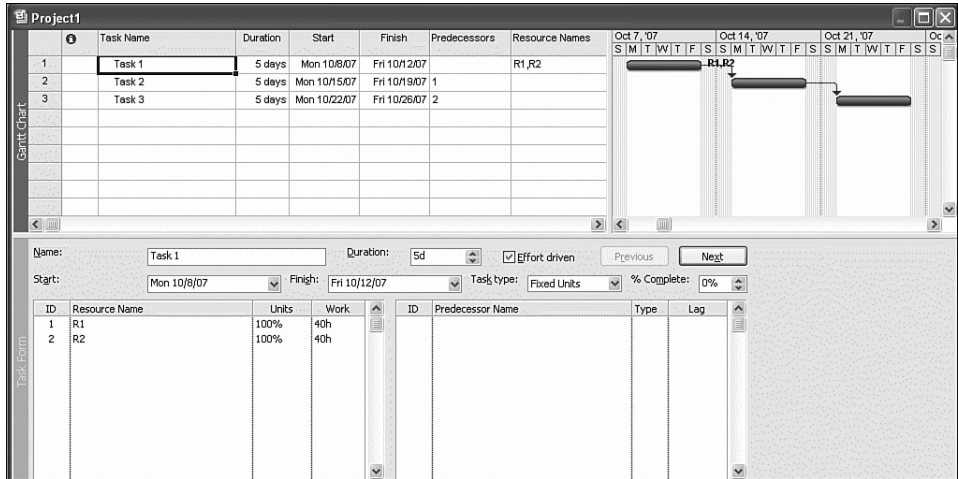
1. On the menu bar, select Window.
2. Click Split. You'll see a view similar to that shown in Figure 2.46.

To remove the split window:

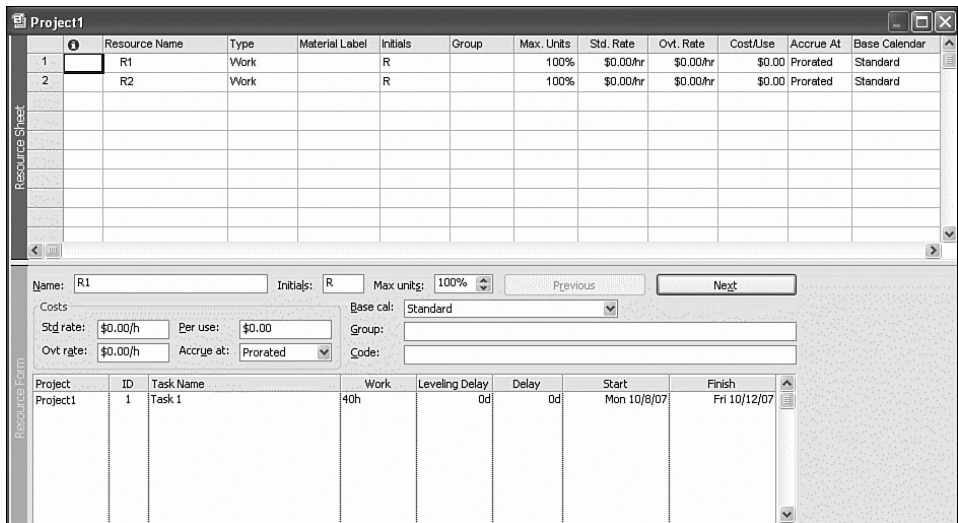
1. On the menu bar, select Window.
2. Click Remove Split. The split window will be removed.

Once you know the secrets of Project and understand that work and unit fields can be different for each resource and do not display on the Gantt Chart view (although they are in the Project data structure) you might find the split window to be invaluable for both reviewing and entering Project data. The split window reveals some of the hidden elements in the Gantt Chart or other views so you can analyze or change the data for tasks, resources, or assignments. The default view in the bottom of the split window for task views is the Task Form. The Resource Form is the default view for the bottom of resource views as shown in Figure 2.46 and Figure 2.47.

There is one annoyance in using the split window when you use it the first time: Sometimes you change the view in the top window, and you really meant to change the view in the bottom window. You start getting lost as to what view you really want to see. Project will change the view based on which portion of the split window you are in, i.e., the top or bottom portion. For novices, I recommend removing the split window when you want to change your views.



**Figure 2.46** Task Form split window for task views



**Figure 2.47** Resource Form split window for resource views

## Using Common Buttons on the Toolbars

You might find some of the toolbar buttons easier than using the drop-down lists from the menu bar. In the following section, I describe some of the most useful toolbar functions in Project.

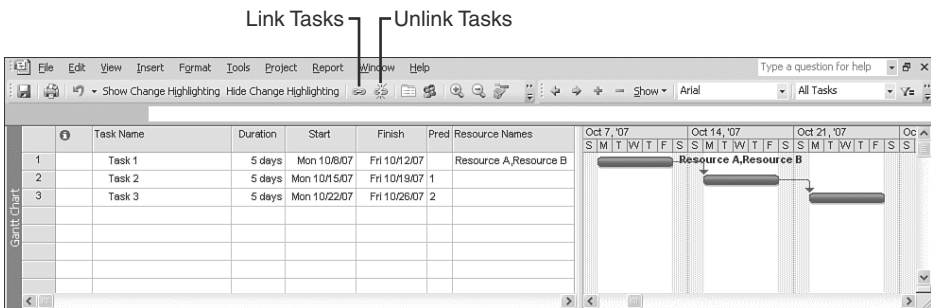
## Link or Unlink Tasks

The Link Tasks button shown in Figure 2.48 allows you to easily create relationships between tasks in your schedule. In Chapter 1 you learned briefly about task dependences, which is another way of describing linking. Linking creates the relationships between two tasks. For instance, one task can't start before another one finishes. Many users learn to type the task identifier created by Project in the Predecessor or Successor field but the following steps provide an easy way to link tasks. To use the Link Tasks button, follow these steps:

1. Click on the first task.
2. If the successor task is next to the predecessor task, press the Shift key and click the second task.

If the tasks are nonsequential in your task list, use the Ctrl key plus a left-click of your mouse to select the tasks.

3. Click the Link icon. The second task is now the successor of the first task selected.



**Figure 2.48** *Link Tasks and Unlink Tasks buttons*

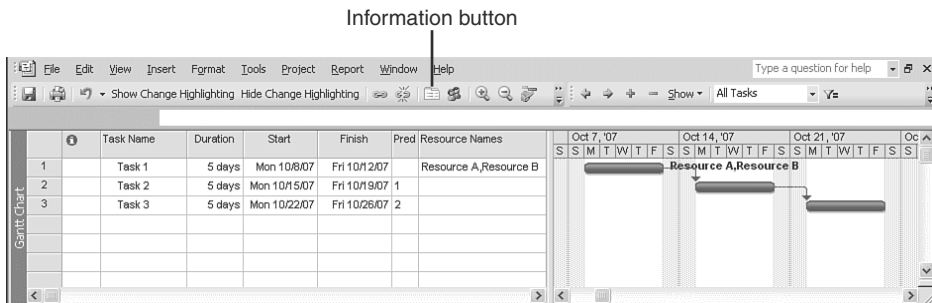
You can also unlink tasks using the Unlink Tasks button. Click on the tasks you want to unlink and click the Unlink Tasks button as shown in Figure 2.48.

## Information Button

The Information button provides more information about a task, resource, or assignment. You saw the Information button in Chapter 1. When you are in a particular view (task, resource, or assignment) and you click this button, as



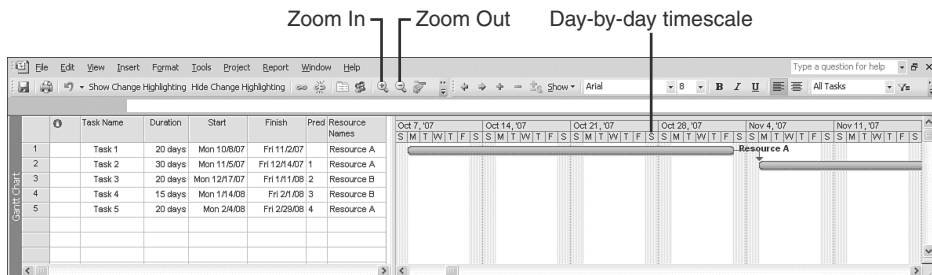
shown in Figure 2.49, you will see a dialog box that allows you to see or enter more information about the task, resource, or assignment than allowed by default in the view. Many people use the Information button to enter data rather than just using the view fields displayed.



**Figure 2.49** Information button displays additional data on task, resource, and assignment views

## Zoom In and Zoom Out on Timescale

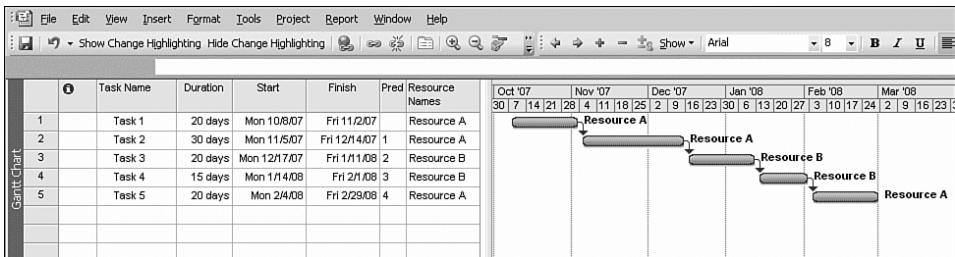
As shown in Figure 2.50 the Zoom In and Zoom Out buttons are convenient-to-display Gantt Chart bars in the timescale based on discrete time spans. By pressing the buttons once or several times in a row, you can change the timescale of the project.



**Figure 2.50** Zoom In and Zoom Out buttons can be used to change the timescale quickly (the timescale is day-by-day)

Let's spend a moment on the Zoom In and Zoom Out buttons, to show how they might be useful to you. Figure 2.50 shows a project as it would normally show using a daily timescale on the right side of the Gantt Chart. As

you can see, the tasks are long, and you cannot see all of the Gantt Chart bars for each task to get a feel for the length of the project. Click on the Zoom Out button (the icon with the minus in it) twice to see a weekly view as shown in Figure 2.51.



**Figure 2.51** *Week-by-week timescale*

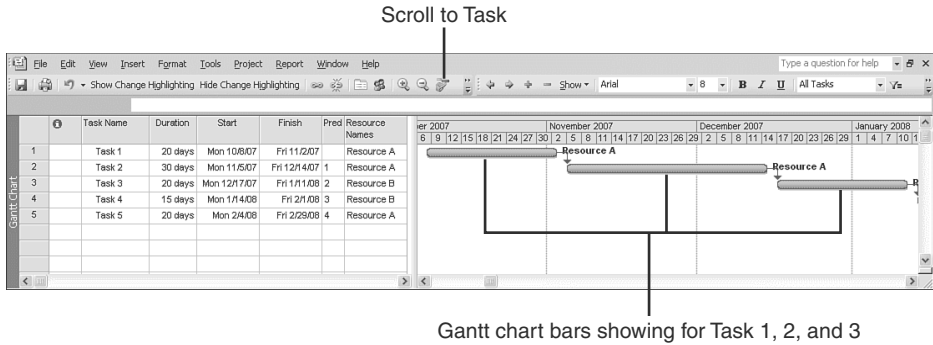
The week-by-week timescale displays a much better view. Viewing weekly rather than daily Gantt Charts allows you to see more of the project at once. To zoom in to see the day-by-day timescale again, click the Zoom In button (the icon with the plus sign in it) twice. Go ahead and click the Zoom In and Zoom Out icons to check out how they change the timescale on any Project view. You might end up using the Zoom In and Zoom Out buttons a lot. If you would like to practice using the Zoom In and Zoom Out buttons, open the project schedule called Ch2-Fig2.50-ForZoomIn-ZoomOutPractice.mpp on your CD.

### Scroll to Task

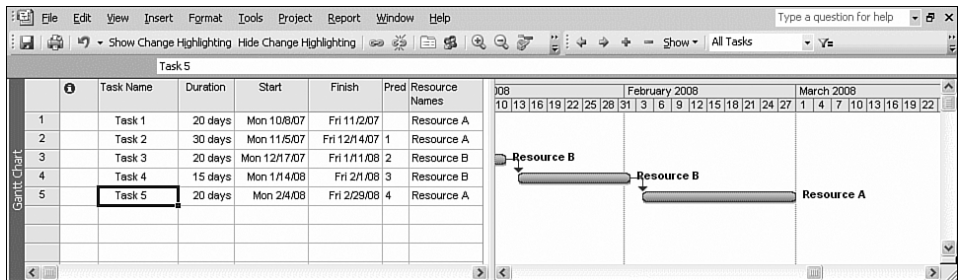
The Scroll to Task button (known as Go to Task in previous Project versions) shown in Figure 2.52 helps you see the Gantt Chart bar for a particular task or other data element on the right side of a view you have displayed when it is otherwise not visible.

In Figure 2.52, you can see the Gantt bars for Tasks 1, 2, and 3. Rather than using the scroll bar to see the Gantt bars for Tasks 4 and 5, you can click on Task 4, then click the Scroll to Task button and you will see the bars as shown in Figure 2.53.

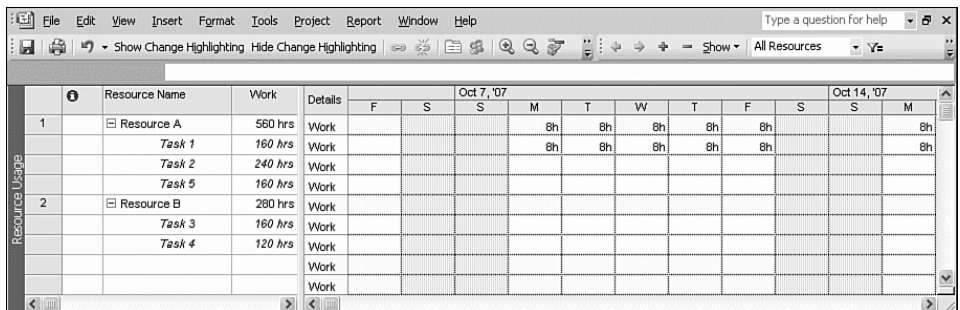
Using the scroll bar in the area below the timescale will do the same thing, but using the Scroll to Task button is much quicker, especially in a long schedule with a lot of tasks. The Scroll to Tasks button also works on the Resource and Task Usage views, which are assignment views. Figure 2.54



**Figure 2.52** Scroll to Task button to display the Gantt Chart bar for any task you select

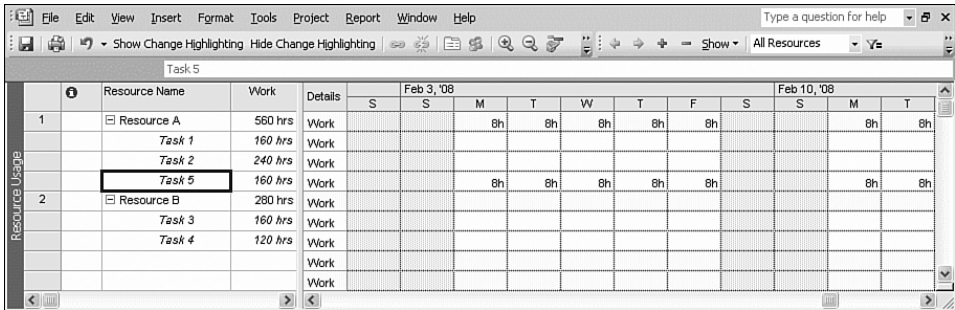


**Figure 2.53** Clicking on the Scroll to Task button for a selected task brings the task's Gantt bar into view



**Figure 2.54** Resource Usage view for five-task project showing only data for Task 1

shows the Resource Usage view for the five-task project. Hours have been assigned to Resource A for Task 5, but they do not show in the timescale. If you select Task 5 and click the Scroll to Task icon you'll see the result shown in Figure 2.55.

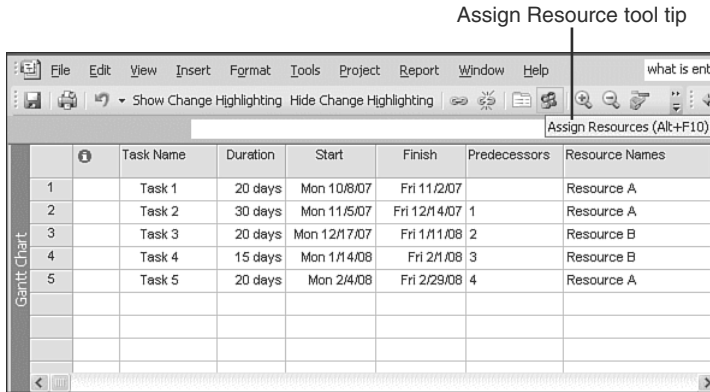


**Figure 2.55** Hours now showing for Task 5 in the Resource Usage view after using the Scroll to Task icon

Using the Scroll to Task button displays data for a task in the right side of a view. You can now see that 8 hours have been scheduled on Task 5 for Resource A starting on Monday, February 4. Because the project begins in October, you would need to scroll a great deal to find the data for the task if you started scrolling from Task 1.

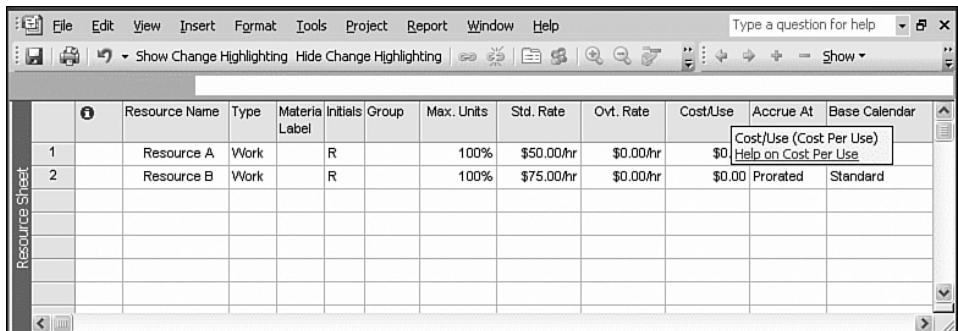
## Hover over Fields to Obtain More Information

Tool tips, screen tips, and the Indicator column in Project are terrific ways to get more information about Project data. For toolbar buttons, Project displays screen tips that describe what a button does. To hover over a field, you need to move your cursor over the field (sometimes it takes a while to get a feel for it), and a tip displays. If you get real good at hovering over icons in Project you will get all sorts of good tips about Project or data in your schedule. For instance, as described earlier, when you hover over the Information icon you will see it named differently, based on the kind of view you are in (task, resource, or assignment). Figure 2.56 shows a screen tip that lets you know the Assign Resources button allows you to enter resources on tasks. It also displays the keyboard shortcut for displaying the Assign Resources dialog box.



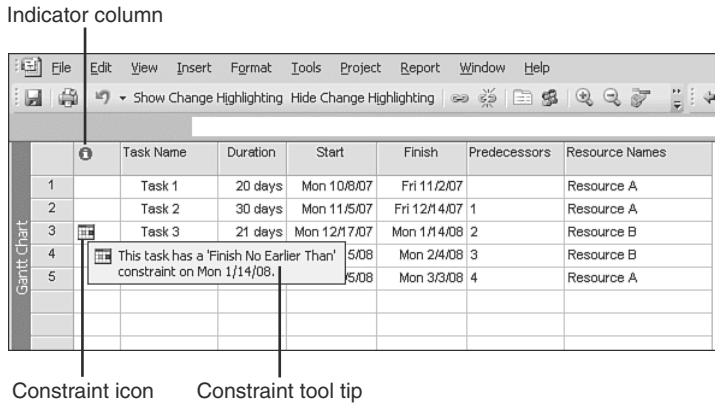
**Figure 2.56** Screen tip for the Assign Resources button also shows keyboard shortcut

You can also hover over column headers in fields to receive a tool tip that allows you to get more information about the field, as shown in Figure 2.57. In this example, the Cost/Use field tool tip also shows the full name of the field in parentheses (Cost per Use) as well as a hyperlink for receiving more information about the field.



**Figure 2.57** Tool tip for the Cost/Use field.

The Indicator column might display important information about a task. In Figure 2.58, the icon in the Indicator field indicates that a constraint is on the task. The constraint indicates the particular kind of constraint (Finish No Earlier Than) and the constraint date of 1/14/08. You could click the Task Information button in the toolbar, go to the Task Information dialog box, and click the Advanced tab to also find out what the constraint is, but using the Indicator field is more efficient.



**Figure 2.58** *Tool tip about a constraint.*

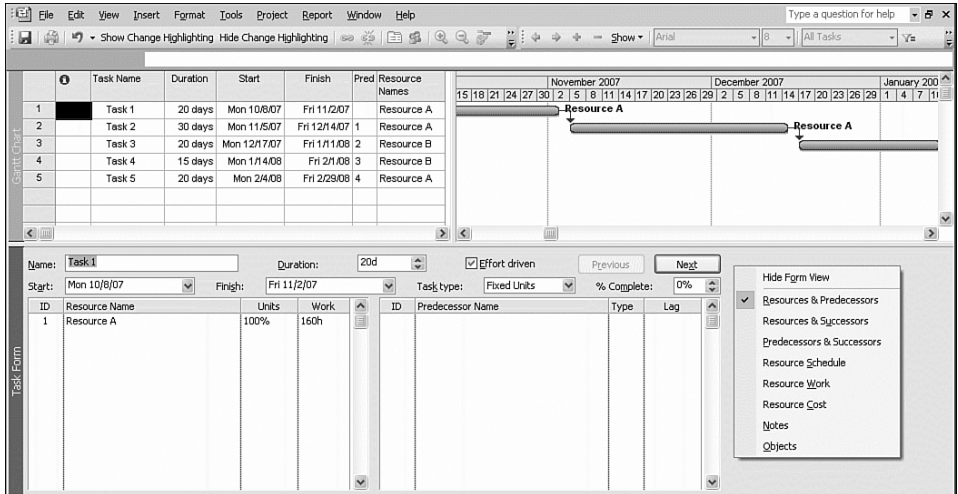
## Right-Click, Double-Click, Click, Click, Click?

As in most Microsoft applications, you can right-click and double-click your mouse buttons to perform functions in Project. With Project, you'll learn that you could have performed a function with a mouse-click, rather than using five keystrokes. Sometimes a right-click or double-click provides dialog boxes you can't seem to find anywhere else. As an example, if you double-click a task, the Task Information dialog box displays immediately for that task. If you right-click on a task, you get a drop-down list that allows you to select the Task Information dialog box, but you can also select Task Notes, which takes you right to the Notes tab in the Task Information dialog box.

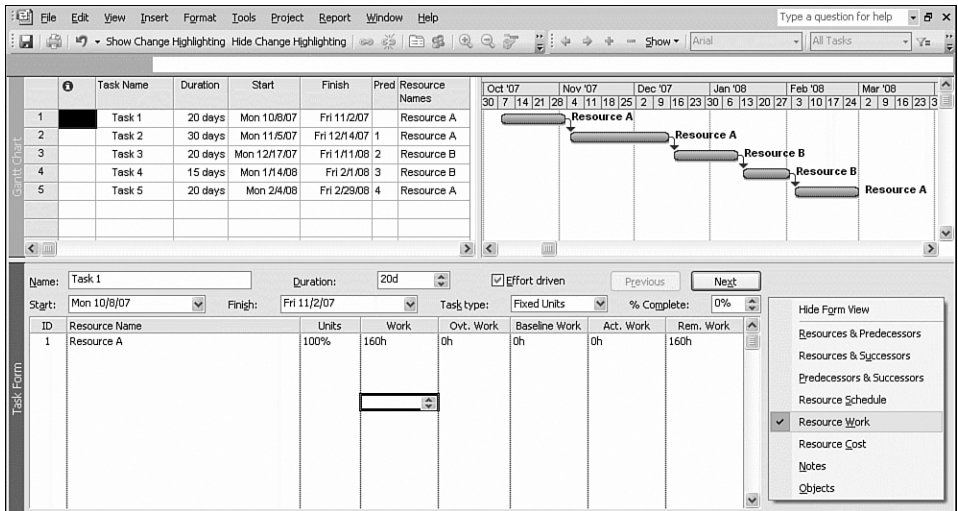
In the Split Window view, you can right-click in the gray area to the right of the Task Form in the bottom window, and see more selections for entering or reviewing information about the selected task as shown in Figure 2.59.

When you start tracking actual work, you can use the Resource Work task form for entering and reviewing the data as shown in Figure 2.60. Notice that you have the resource assignment information such as Work, Baseline, Actual, and Remaining work all in one place. If you remember the formula for Work described earlier, this can be very important to see when the data starts changing for your project schedule.

What you get when you right-click or double-click is different based on what part of the screen your cursor is sitting in. Just a fraction of an inch difference in where your cursor is can make a difference in what you see. As you



**Figure 2.59** Right-clicking in the Task Form brings up more views.



**Figure 2.60** Resource Work in the Task Form in a split window.

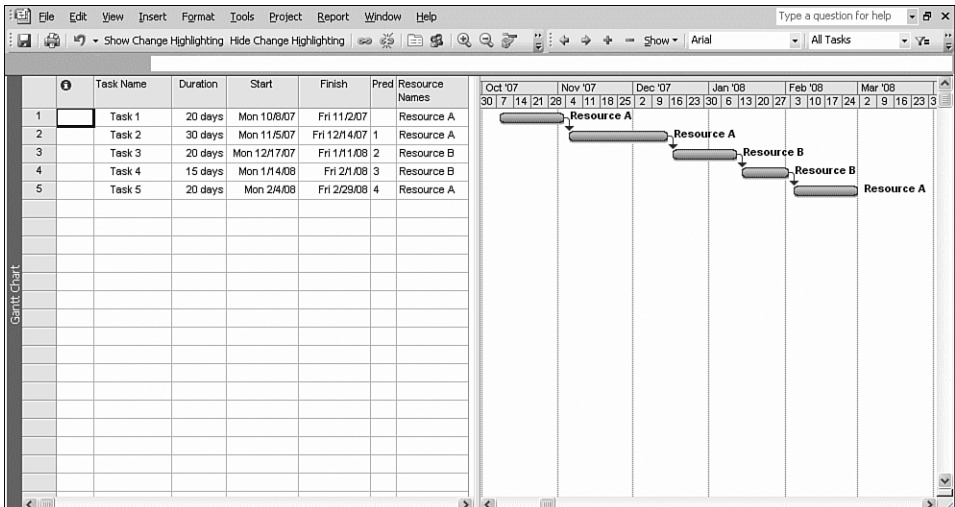
use Project, hover, click icons, right-click, or double-click here and there and see what you get. You might be surprised and learn more about Project in the meantime.

## The Major Project Views

As previously discussed, Project provides interfaces into its data structure called views. Views allow you to both enter data and review data in table and visual formats. You've seen a lot of the views in this chapter, and most views involved the Gantt Chart. This section focuses on some of the most important views you will want to use. You will want to move between the views easily to help you analyze Project information. To select any of the following views, click on the view in the view bar if you have it showing, or select View from the menu bar, and click on the view showing in the drop-down list.

### Gantt Chart View

Let's say you are ready to start a new schedule. The Gantt Chart view is the first view to open, but it is also a great way to enter your task data. You can enter all of your tasks and quickly create relationships between the tasks in this view. You can essentially create an outline of your project in this view. As shown in Figure 2.61 I can enter the task names, durations, and resources, and see the relationships of the tasks easily in this view.



**Figure 2.61** *Gantt Chart view: The left side helps you build task outline and right side helps you understand dependencies and the path of your project*



If you use the split window or the Task Information dialog box, you can add more data for each task as well. You might want to add the Work and Successor columns to this view to have just a bit more information when building the schedule. As you draft your schedule by adding and changing tasks and assigning resources, you can watch how the tasks change by looking at the right side bar chart. The bar chart especially helps you analyze the path of the work in your project schedule.

## Resource Sheet

Before adding resources to your schedule, it's a good idea to build the team of people who can work on your project. The Resource Sheet is the main view for entering the resources available to work on your schedule and to enter data about them (e.g., their hourly rate or resource group). As shown in Figure 2.62 the Resource Sheet provides a table for entering major resource data.

	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar
1	Resource A	Work		R		100%	\$50.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
2	Resource B	Work		R		100%	\$75.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
3	Resource C	Work		R		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
4	Resource D	Work		R		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
5	Resource E	Work		R		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
6	Equipment 1	Work		E		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
7	Cost Resource 1	Cost		C						Prorated	
8	Material Resource 1	Material		M			\$0.00		\$0.00	Prorated	

**Figure 2.62** Resource Sheet for adding resource attributes

You want to enter the resource names using some consistent naming format, and then add a rate (Std. Rate) to indicate their cost of doing work (if appropriate) and how much they will be available for the project (Max. Units). By opening the Resource Information button for the resources (by double-clicking on each resource name), you can change their calendar to indicate how many hours per day they are available to work, and if there are any days they cannot work, such as vacation days. This view is often ignored, because people add names in the Resource names field in the Gantt Chart

view, but it is a good idea to review the Resource Sheet view frequently to see if you have duplicate resources (remember, Jim Moore and JimMoore are two different resources to Project) and to understand the attributes assigned to your resources to make sure they are assigned consistently.

## Task Usage View

The Task Usage view, as shown in Figure 2.63 is best for looking at how the work is assigned to each resource on your schedule. Each task shows the resource individually listed under the task. In Figure 2.63 notice that Task 1 has two resources on it and the rest have only one. Resource A and Resource C each are working 40 hours for the week of the 7th and 14th. The total work for Task 1 is 80 hours a week for two weeks.

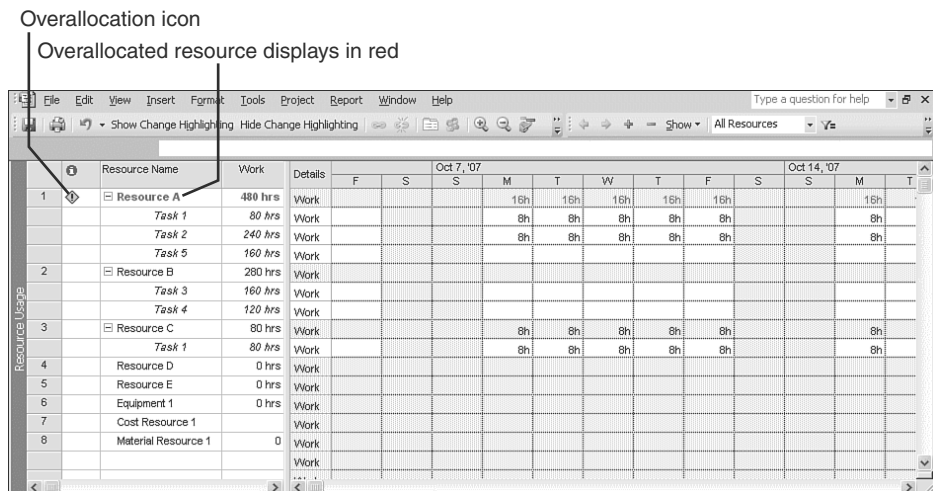
Task Name	Work	Details	Nov '07				Dec '07							
			7	14	21	28	4	11	18	25	2	9	16	
1 Task 1	160 hrs	Work	80h	80h										
Resource A	80 hrs	Work	40h	40h										
Resource C	80 hrs	Work	40h	40h										
2 Task 2	240 hrs	Work			40h	40h	40h	40h	40h	40h				
Resource A	240 hrs	Work			40h	40h	40h	40h	40h	40h				
3 Task 3	160 hrs	Work									40h	40h	40h	
Resource B	160 hrs	Work									40h	40h	40h	
4 Task 4	120 hrs	Work												
Resource B	120 hrs	Work												
5 Task 5	160 hrs	Work												
Resource A	160 hrs	Work												

**Figure 2.63** Task Usage view to analyze how task resources are assigned to tasks on a timephased basis

The Task Usage view is more of an analysis and troubleshooting view rather than an entry view although you can enter work amounts in the view. Once you enter work into this view, it sets the work and you will find it harder to adjust the work later. You can see how you assigned resources on a task on a day-by-day, week-by-week, or month-by-month basis. You may want to use this view to enter Actual Work on a day-by-day or week-by-week basis. See how to enter Actual Work data in this view under the Resource Usage view description.

## Resource Usage View

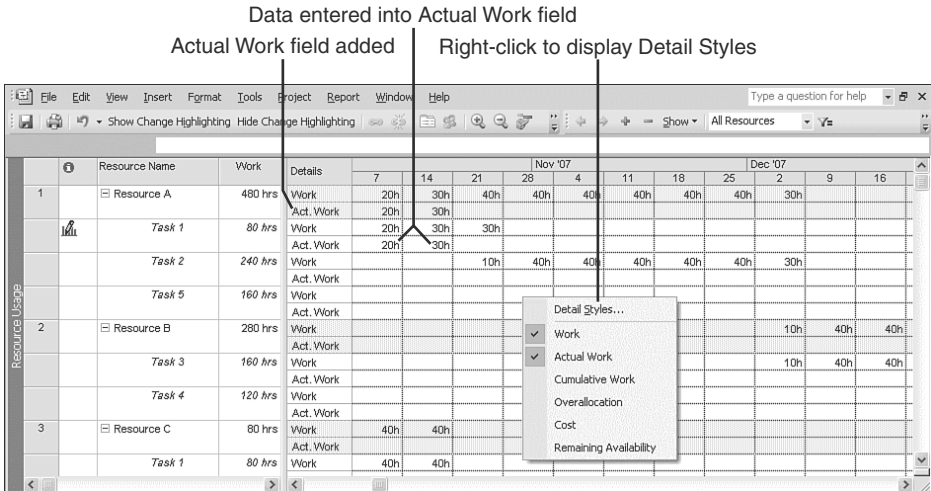
In contrast to the Task Usage view which focuses on tasks, the Resource Usage view focuses on showing all the tasks each resource has been assigned. The Resource Usage view is the best view for showing if a resource has too much work, as each task the resource is assigned is listed under each resource. The Resource Usage view, shown in Figure 2.64, allows you to look at the tasks to which a resource is assigned. Notice that in this view, Resource A is assigned to three tasks, and is assigned to Task 1 and Task 2 at the same time. In this view, the overallocated resources are shown in red, with an icon next to them indicating this overallocation.



**Figure 2.64** Resource Usage view for analyzing tasks assigned to resources and overallocation of work

This is extremely handy for analyzing how a resource is assigned to work on a day-by-day, week-by-week, or month-by-month basis.

You might want to use the Resource Usage and Task Usage views to enter actual work information. You can add fields to the right side of Usage views to help you enter or review other data. For instance, you want to enter actual work for Resource A for the weeks of October 7 and October 14. You could include the Actual Work field to enter the data as shown in Figure 2.65. To add the field, right-click in the right side of the view, which opens the Detail Styles dialog box for fields that can be added to the view. Click the Actual Work field that displays in the drop-down list and it will be added to the right side of the view.

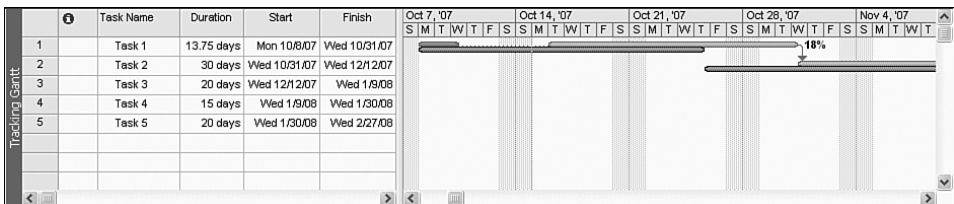


**Figure 2.65** Right-click to add more fields to the right side of a Usage view.

You might want to print the Resource View out with a day-by-day or week-by-week view so resources can write in the hours they work each day or each week. Then you can enter the actual work into the view directly from how they filled in the fields.

### Tracking Gantt View

Once you start tracking your schedule to see how entering task progress affects the schedule you might want to use the Tracking Gantt view as shown in Figure 2.66. If you baseline your schedule to record your estimates, you can quickly see the difference between your original baseline estimates (the lower bar in Figure 2.66) and the actual work progress and the new date your work is estimated to complete (the top bar in Figure 2.66).

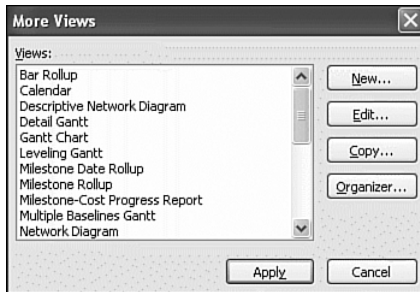


**Figure 2.66** Tracking Gantt view indicates the change in schedule based on entering task progress

Notice that in Figure 2.66 the original estimate for completion was 10/25/07, but as Actual Work was recorded for the timeframe, the new Finish date is now 10/31/07. Based on reviewing the Tracking Gantt view, you can decide if you think you need to ask resources to work overtime or your project can tolerate the delay at the current pace.

## More Views

Project contains 25 views that you can use for entering and analyzing your project data. The view bar shows only some of them. If you would like to see all the views available, select Views from the menu bar, and click More Views as shown in Figure 2.67.



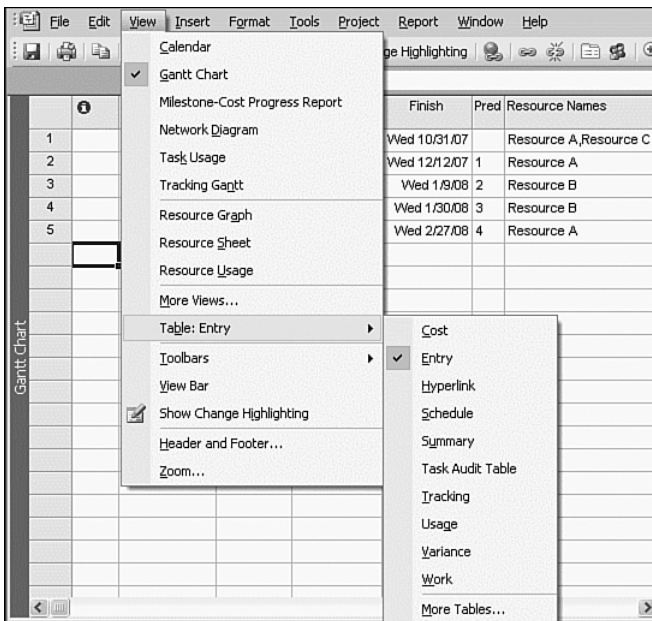
**Figure 2.67** A list of more views available in Project

Take a look at some of the different views and how the data is different in each view. You can open the file called Ch2-Fig2.67-DifferentViewsPractice.mpp on your CD to practice switching between views and reviewing the practice. You can use any of the tips already described to manipulate the data in the views you review.

## What Are Project Tables?

Tables are preset columns in Project that expose different fields in Project in sheet format, usually based on a particular function for schedule analysis or data entry. For instance, if you want to enter actual task progress information, such as percentage complete or actual duration, there is no obvious view to allow you to enter this data. However, Project has a table called Tracking that contains fields for entering actual values.

When you select Views and scan down the drop-down list, you will see a selection called Table: Entry as shown in Figure 2.68. By default, the sheet format table associated with the Gantt Chart is the Entry table. Its purpose is to allow you to enter data into the most common fields of Project. However, you could choose to display a different table on the left side of the separator bar, such as the Tracking view. Tables can display columns about tasks or about resources, depending on what kind of view you are displaying.

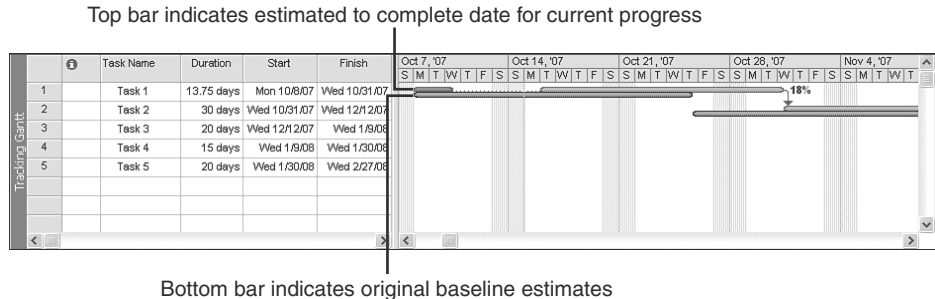


**Figure 2.68** Selecting a different table for the Gantt Chart view

To see the Tracking table in the Gantt Chart view, select Views from the menu bar. Hover your mouse over the Table: Entry selection until you see another drop-down list, then click Tracking. Figure 2.69 shows several tracking fields available in Project that by default display in the Tracking table.

Sometimes you can get confused if you do not remember to return the table to the original view, so to display the Entry table again, select Views from the menu bar, then hover your cursor over Table: Tracking until you see the drop-down list, then click Entry.

Project allows you to build your own custom tables and views. As you start to understand Project better, you might find that you want to design your



**Figure 2.69** *The Tracking table in the Gantt Chart view*

own data entry tables and views specific to you or your organization's needs. Chapter 11 describes how you can create your own custom tables and views.

## Practice: Navigating and Using Project Views

Now that you've learned some of the basics of Project, it's time to practice them. The following practices allow you to get familiar with the Project interface by creating a new project, adding tasks, inserting columns, and learning to use various views and some of the tips presented so far in this book. This practice will contain some figures to help you make sure you are seeing what's expected, but eventually, practices will include just the steps you should perform.

### Practice 2.1

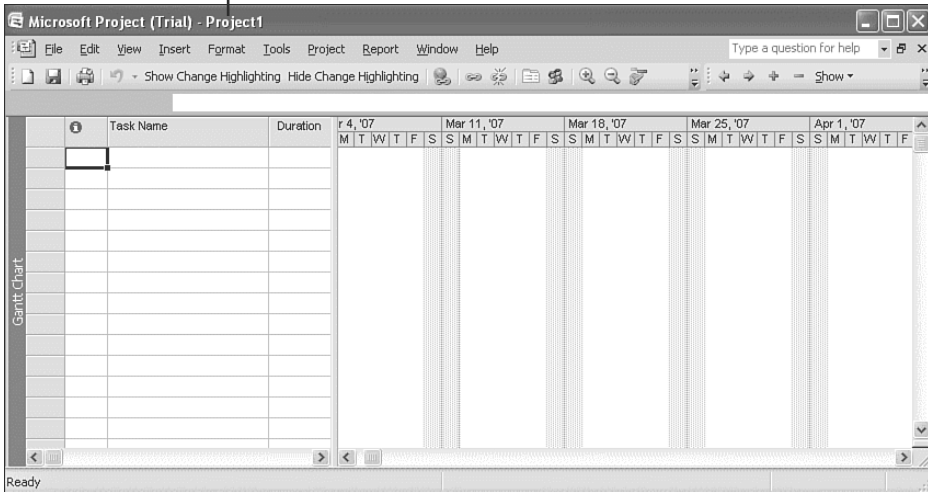
#### Creating a Project and Using Views

This practice will help you to see the various fields available in the Project data structure. You will also practice adding columns to the Gantt Chart view, which is handy when you have a view up and want to see more information. Don't be surprised if some new tips are introduced—it's to keep you on your toes. However, if you don't perform the practice, the tips will be described in subsequent chapters.

1. Open Project. You should see the Gantt Chart view. You might have a side pane on the left of the interface that displays the task pane if you are using Project 2002 or Project 2003, or the Project Guide if you are using Project 2007.

2. Close the side panes by clicking the X showing in the upper right corner of the side panes until you see a screen similar to Figure 2.70. See the earlier section called “Navigating Project and Some Quick Tips” for more information about the side panes and removing them from the Project interface.

Project is named Project1 until it is saved



**Figure 2.70** Gantt Chart interface without a side pane showing

### Your view might not be the same

Please note that the view you see might be slightly different. Your toolbar might display some different buttons, or you might see a View Bar on the left side of your view based on previous selections made for using Project. The Project interface will not always be the same, depending on settings and options each user selects when using Project.

3. Notice that the project schedule's name is Project1. The project will keep this name until you save it. Every time you start a new project in a session, Project will assign the next sequential number to each temporary project. Enter Task 1 in the Task Name field and move the cursor to the Duration field by pressing the right arrow key on your keyboard or clicking your mouse in the Duration field. Project automatically enters 1 day in the Duration field, and today's date in the Start and Finish date fields (unless some rule has been set differently in your version of Project).



Notice that Project enters the number 1 in the gray area to the left of the task. This is the task ID that indicates the position of the task in the task list. Once you create a more comprehensive task list, Project will assign a new ID to the task if it is moved.

4. To expose other fields in the Project data structure than those that appear in the Gantt Chart view by default, you can insert a field in any view. In the current Gantt Chart view, click the Duration field (you can click the Duration header to highlight the entire column, or in Duration field's cell if you like).
5. Select Insert on the menu bar and click Column in the drop-down list.
6. The Column Definition dialog box displays as you saw in Figure 2.3 and Figure 2.4.
7. In Field name, click the drop-down arrow to the right of the field.
8. Now scroll up and down the list of visible fields by clicking on the scroll bar. This illustrates the numerous fields available in Project for a view. In fact, each of these fields is actually in the data structure for each task. Data might already be in the field if you were to add it to the view (although the data might be a zero, an NA, or as in the Duration field, 1 day).

Find the Text1 field and scroll down some more. Note that there are 30 Text fields. These are fields in Project available for you to use or customize to further describe the task as you want. For instance, you might include a description of an issue associated with the task. Custom fields are discussed more in Chapter 4.

9. Now, scroll up until you find Actual Duration and click OK.

### **Most dialog boxes have an OK button, but some don't**

Note that most dialog boxes in Project have an OK button to enter the action you are performing, but a few pop-up boxes do not have an OK button. Double-check to make sure there is an OK button on the dialog box. If not, you can close the box and the change you made will be applied.

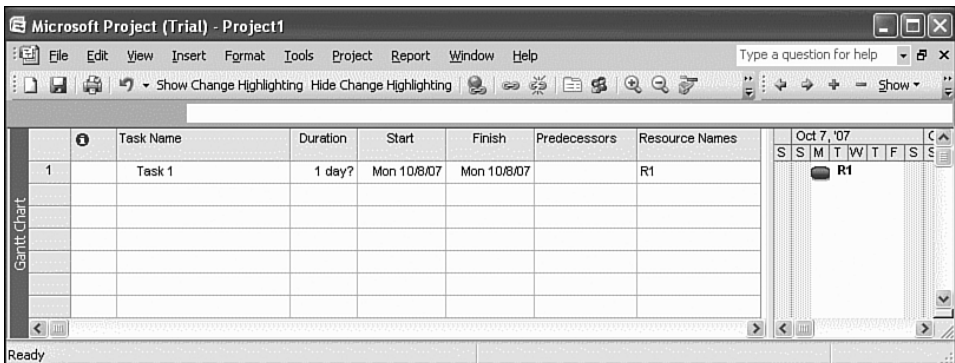
10. You should now see the Actual Duration column after Task Name and before Duration.

When you choose to insert a column, it is inserted to the left of the column on which your cursor is positioned. You might practice adding several other columns, perhaps including Remaining Duration, using these same instructions to see the various fields you could add to the views you have.

11. Now, because you have added a column and exposed a field in the Project data structure in the Gantt Chart view, it might be useful to know how to get rid of it.

Click the Actual Duration column header so the column is highlighted. You can either press the Del key on your keyboard or you can right-click and select Hide Column in the drop-down box. You are not deleting the column, only removing exposure of it in the view you are using. You cannot actually remove a column or field from the Project data structure, so don't worry about hiding columns in any Project view.

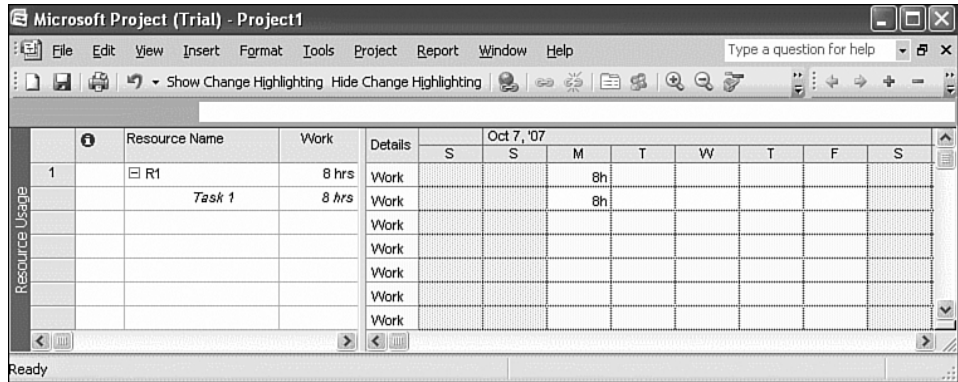
12. To see another view of this task, select View from the menu bar and click Resource Sheet. Because you have not added any resources yet, this view is blank. If you decide to show the View Bar to the left of your Project interface, you can select the Resource Sheet from the View Bar if that is easier for you.
13. Enter R1 in the Resource name field. Notice that Project has entered data in the row for the resource. This resource's row of data is now added to the project (if you save the project). Also notice that the resource ID of 1 has been entered for the resource.
14. Select View from the menu bar, and click Gantt Chart again. On Task 1, click the Resource Name field (you might have to move the separator bar to the right to see the Resource Name field). Click on the arrow that displays after you click the Resource Name cell. R1 will display in the drop-down list. Selecting a resource this way is better than typing in the resource: R1 and R 1 are two different resources to Project. You should have a Gantt Chart similar to Figure 2.71 (although your Start and Finish dates might be different).



**Figure 2.71** Gantt Chart now shows Task 1 and R1 assigned to the task.

15. Select View from the menu bar, and click Resource Usage as shown in Figure 2.72. You should see 8 hours on the Start date of the task. If you cannot see the 8 hours, click on Task 1, and then click the Scroll to Task button in the

toolbar (see the earlier section “Navigating Project and Some Quick Tips” for more information about the Scroll to Task button).



**Figure 2.72** Resource Usage view showing that R1 is assigned 8 hours of work for Task 1

16. Because this is a simple practice, it's not worth saving this project. Select File from the menu bar and click Close in the drop-down list. Click No in the resulting dialog box. Project is still open but you have no active project in it.

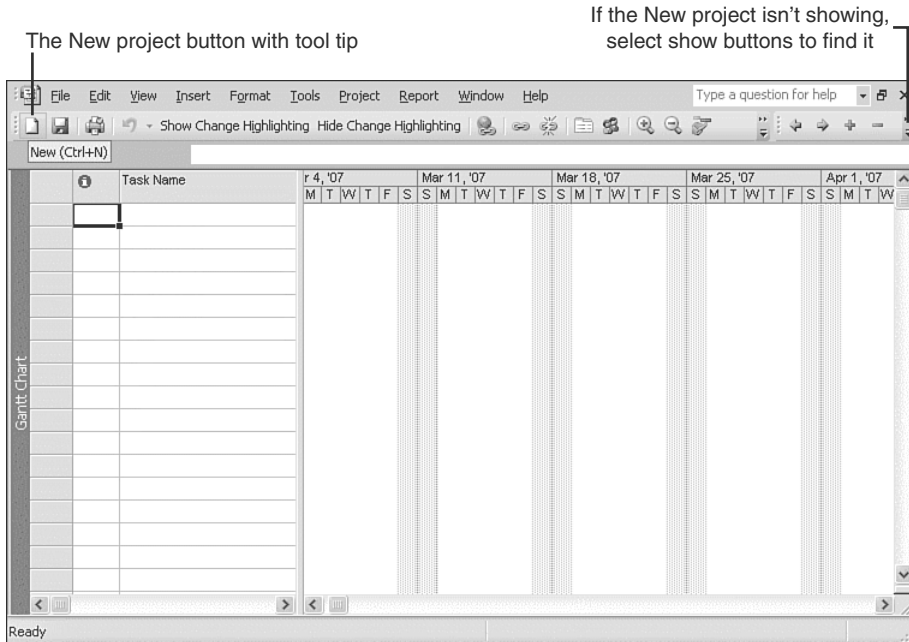
So now you have inserted a column to expose more of the Project data structure and moved about to navigate in different views for a one-task project.

## Practice 2.2

### Creating a New Project and Using the Split Window

This practice helps you become familiar with using the Split Window function as the split window is used often in this book for practices and to explain concepts. The split window allows you to see hidden data fields that are not readily available in the default Gantt Chart view.

1. Start with all projects closed in Project (click Close after selecting File from the menu bar until Project is all gray). To create a new project, click the New project button, shown in Figure 2.73. If you do not see the New button, select Show buttons as also shown in Figure 2.73 and click the button.
2. If the task pane or Project Guide is showing, click on the X in the upper right corner of the pane.
3. If the view bar is showing on the far left of the Gantt Chart, select View from the menu bar, and click View Bar to remove it. Remember you can display or



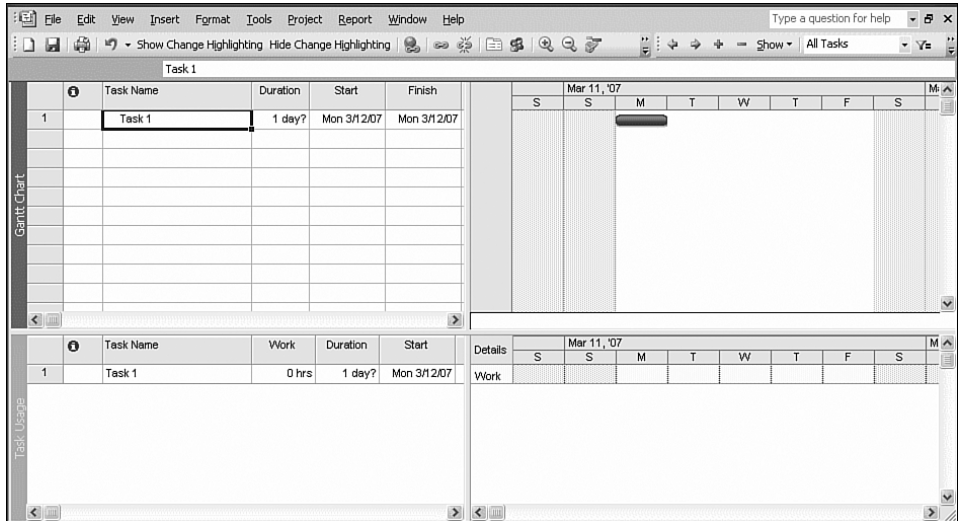
**Figure 2.73** Use the New Project button to create a new project

not display the View Bar to the left. You can gain more room on your view if you remove it.

4. Add a task name (e.g., Task 1) on the first line of the project and click the Duration field on the task.
5. Select Window from the menu bar and click Split.
6. The split window appears with the Task Form view in the bottom portion of the window. Make sure you click in the top Gantt Chart portion of the view. Notice that the Gantt Chart name is highlighted at the very left of the top window, and that Task Form name is dimmed in the bottom portion.
7. Make sure your cursor is on the new task you created in the Gantt Chart.
8. Now click in the bottom window. You can click in the field under Resource Name, for instance. Notice that the Task Form name on the right side is highlighted, and the Gantt Chart name now is faded out. You can easily click between the windows, and the active window is highlighted, whereas the inactive window's view name is dimmed.

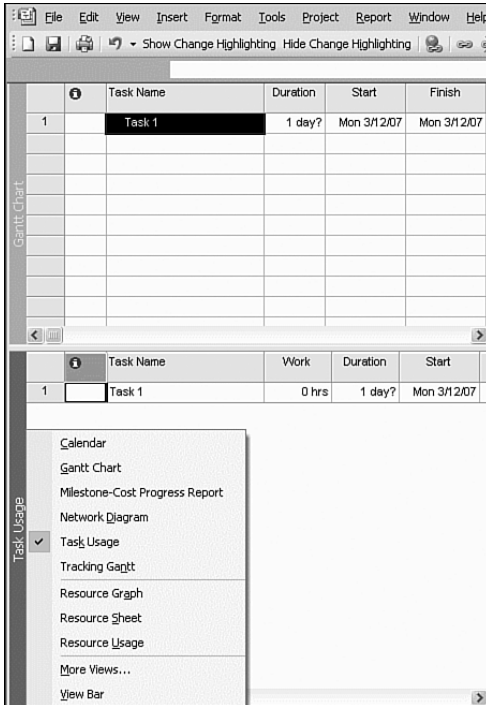
Also notice that in the Task Form, not only can you see Resource Name, you can see Units and Work. Because the Work field is not shown by default, nor is it shown for each resource on the Gantt Chart view, you might find it useful to see resource work data.

9. Right-click the Task Form name in the horizontal strip in the bottom window. A drop-down list of available views displays. Click the Task Usage view. Only the line in the Task Usage view for the task you have in the upper window appears as shown in Figure 2.74. If you had not selected Task 1 in the upper window, you wouldn't even see the display as shown in Figure 2.74—there would be no line item showing.



**Figure 2.74** Task Usage view in bottom window

10. Let's say you want the Task Form back in the bottom window. Right-click again on the Task Usage name on the left of the bottom window. Where is it in the drop-down list? It's under More Views, as shown in Figure 2.75. Select More Views.
11. In the More Views dialog box, scroll down until you find the Task Form view, and then select it.
12. Click Apply. If you did anything to click out of the windows or off the task name as described here, you might be somewhat lost in the windows. As a general tip, if you use the split window and have the wrong view up in the top or lower window, remove the split and start over.  
If you followed these directions to the letter, you are back to the Gantt Chart showing at the top and the Task Form showing at the bottom.
13. To remove the split window, select Window from the menu bar.
14. Click Remove Split. For those of you who are back to the familiar Gantt Chart view, congratulations! For those of you who still don't see the Gantt Chart view you are used to, right-click on whatever view you see in the left area of



**Figure 2.75** Select More Views to get to the Task Form view again

the view, and select Gantt Chart from the drop-down list. You might want to try this exercise again, just to practice with the split window to get used to it.

15. Close the project without saving by selecting File, then click Close and click No in the resulting dialog box.

## Summary

Hopefully you learned some of the most important secrets of Project in this chapter. By learning the secrets now, you are armed with more information than many users have after using Project for years (including myself when I first took a simple class to get me started in Project a long, long time ago). In fact, I have taught classes in which I introduce these secrets immediately and a student nods and says, “So now I understand! I never knew why I felt Project had a mind of its own.” You were introduced to the concept that Project is a data structure with hidden fields and rules for tasks, resources, and assignments and those rules affect the behavior.

Some primary Project data fields are Work, Duration, Cost, Start and Finish dates, Predecessors/Successors (task relationships), and Units (how many resources are assigned to complete a task). Also, by default, Project has flags set that affect how tasks behave (e.g., Effort-driven, Task Type, Constraint) or how resources are assigned work over time (Work Contour). One of the major behaviors in Project is that it designates assignment of work over time, called timephased work. Not only does Project assign work over a time span (e.g., daily, weekly, monthly), but you can select different timescales to see how a resource is assigned to work over that timescale.

In addition to major fields and flags, Project has different states for fields. For instance, Current work or Duration is the estimate for the value at completion, Baselined is a point-in-time estimate (usually the original or agreed-to value), and Actual is the actual value for work or duration of a task reported during execution and tracking. Remaining Work is the amount of time estimated to complete assigned work or duration after progress has been recorded. These common designations for fields in Project are also part of important formulas in Project. Some of these formulas are as follows:

$$\text{Duration} \times \text{Units} = \text{Work}$$

$$\text{Actual Work} + \text{Remaining Work} = \text{Work}$$

$$\text{Actual Duration} + \text{Remaining Duration} = \text{Duration}$$

$$\text{Actual Cost} + \text{Remaining Cost} = \text{Cost}$$

$$\text{Standard rate of resource(s) assigned} \times \text{Work hours} = \text{Cost of a task}$$

If you know that these formulas exist, and cannot be altered in Project, then you start to understand the behavior of Project.

By understanding that resources have availability based on their calendar of time available to work, and how much they can be assigned to a task (called units), you begin to understand that you could overallocate a resource by assigning more work than is possible for that resource to complete.

Hopefully, the navigation introduction helped you to get around in Project and you will try some of the tips while using the schedule-building methodology described in the rest of this book. You can use the major views—Gantt Chart, Resource Sheet, Resource and Task Usage, Tracking Gantt—and tables, such as the Entry and Tracking tables, to enter data and to review and change a schedule according to your specific requirements.

The next chapter starts you off on your schedule-building journey. Using a particular method and sequence of building your schedule, you can use Project as a tool to help you manage your project, rather than the obstacle it can feel like to the unenlightened.

## Review Questions

1. When you do not see a field in a view you would like to see, how do you expose the field?
2. What are three categories of the project data structure?
3. Name five of the primary Project fields.
4. How can you see timephased data in Project?
5. What four designations are associated with the Work and Duration fields?
6. What is the most important formula to know in Project?
7. How is a resource's availability calculated in a project?
8. What is the View Bar?
9. What displays in the lower window of the Gantt view in Project when you select Split Window from the menu bar in Project?
10. Why would you want to use the Scroll to Task button?
11. Why would you use the Tracking table rather than the Entry table?