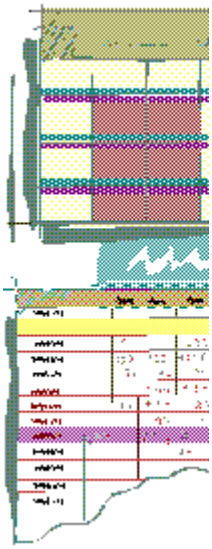
Choosing the right view

A view is a window into your project information where you can enter, edit, and view your data. You'll find easy access to the most commonly used views by clicking a view on the View Bar.



What kind of information do you want to see?

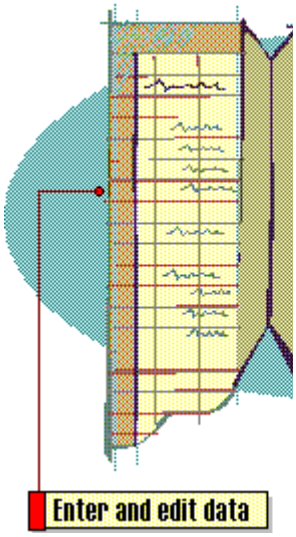
- Basic task information (Gantt Chart)
- Tasks on a calendar (Calendar view)
- Tasks on a flowchart (PERT Chart)
- Resources organized by task (Task Usage view)
- Resources on a graph (Resource Graph)
- Resources in a spreadsheet (Resource Sheet)
- Tasks organized by resources (Resource Usage view)

Basic task information (Gantt Chart)

The Gantt Chart is the view you'll use most often to clearly see, enter, and edit basic task information and task dependencies. You can also see how tasks occur over time.

The Gantt Chart view includes two parts: a table for entering and changing data and a chart for displaying the data as bars on a timescale. When you change the data in one portion of the view, it shows up immediately in the other portion.

Click GanttChartWizard  on the toolbar to quickly and easily customize this view.



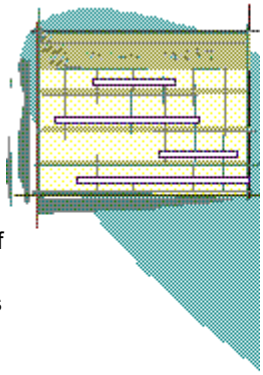
The graphical bar chart and link lines make it easy to see the dependencies between tasks. You can adjust the timescale to clearly show when tasks occur.

The table portion of the Gantt Chart view displays important task information as

text, numbers, and icons (task indicators). You can easily enter, edit, and change task information. You can also add columns to the table to display other task data you want to see or select a different table, such as the Cost or Tracking table.

Tasks on a calendar (Calendar view)

Use the Calendar view to keep tabs on when tasks occur. You can quickly see how long tasks take, when they start and finish, and how they occur in relation to other tasks. The Calendar view is very useful for creating and printing an individual's work calendar of tasks for the month.



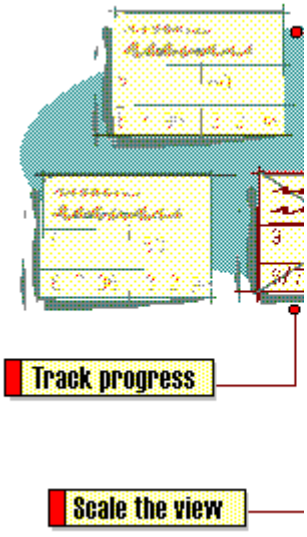
In the Calendar view, you can:

- Apply filters to display the category of tasks you want.
- Change the timescale to show weeks or months.
- Use the many formatting options to change the bars, text, and headings.
- Apply shading to days that you define as nonworking time.

Tasks on a flowchart (PERT Chart)

Use the PERT Chart view to see a flowchart of your project. Each box (or node) represents a task in the project. Arrows connecting the boxes show dependencies between tasks.

You'll find that the PERT Chart is an excellent way to view task dependencies in a visual format and is useful for displaying on a wall.



You can change the type of information to display the data that you need to see. Each PERT box displays up to five pieces of information about a task.

You can change the scale of the PERT Chart view to see more or less of the entire diagram. You can also change the size of the boxes to one of four sizes.

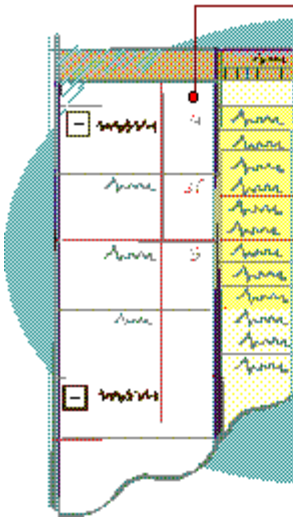
Completed tasks appear as PERT boxes with crossed diagonal lines. Tasks that are in progress appear with one diagonal line. Important tasks are color coded. For example, critical path tasks are solid red.

Resources organized by task (Task Usage view)

Use the Task Usage view to work with task and resource information side by side.

With the Task Usage view, you can easily create useful, real-world reports about when a resource is scheduled to work on a task over a period of time. For example, a task scheduled to take 1 week to complete has a work estimate of 20 hours. This view shows you when those 20 hours of work will occur during the week.

Seeing clearly which resources are working on a task, and when work is occurring, can help you make better decisions about your project.



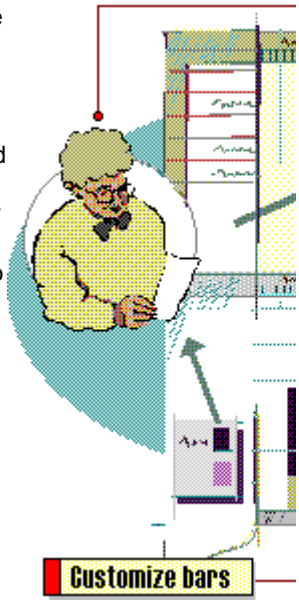
You can edit the hours that a resource is assigned to a task directly in the timescale on the right side of the view. You can also change the number of resources working on a task.

You can change the information displayed to include actual, scheduled, baseline, and cumulative work, as well as actual versus scheduled cost. (You can quickly do this by right-clicking to open the shortcut menu.) By changing the timescale, you can see more or less detail. This is a good view for seeing earned value data across time.

Resources on a graph (Resource Graph)

Use the Resource Graph view to see whether resources are overallocated, what capacity they're working at, and how much they cost. The Resource Graph view shows you, in an easy-to-interpret timescale graph, information about the resources on your project based on a category you select.

Although you cannot change any of the data in the Resource Graph view, you can use resource filters to display only the information you want to see, such as the cost or work that is over budget.



You can change the color and pattern of the graph bars. You can also display the kind of information you want to see about a resource, including work capacity, availability, and cost.

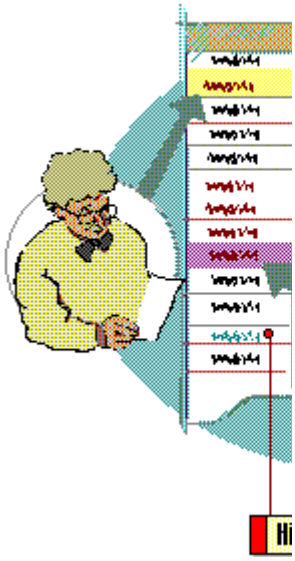
You may find it useful to display the Resource Graph in combination with another view, such as the Gantt Chart. With both views displayed, you can review and compare the resource information for one or more resources at a time.

Resources in a spreadsheet (Resource Sheet)

Use the Resource Sheet view to review, add, or edit data about resources and to copy or paste information from one resource to another. You can display information such as the payment rate, the work hours assigned, and the baseline (planned) and actual cost for each resource.

You can also modify the Resource Sheet view to better meet your needs. For example, you can apply

a different table to see resource information from a different perspective or apply a filter to display only the information you want to see.



You can format specific information to call attention to it. For example, you can apply bold formatting to a higher-than-expected cost.

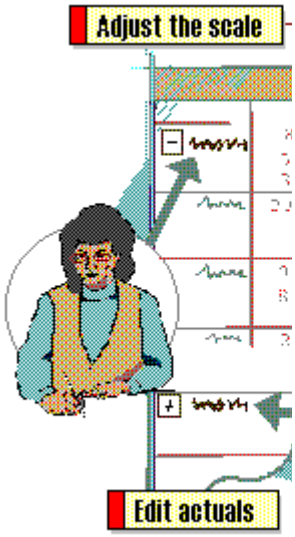
You can format a category of information to distinguish it from others. For example, you can format all overallocated resources as italic text in a larger font size.

Tasks organized by resource (Resource Usage view)

Use the Resource Usage view to work with resource and task information side by side.

You can see the amount of work for each resource, make changes, and see the impact immediately. For example, if a resource is scheduled to work on a task for 40 hours over 2 weeks, you can see and adjust when those 40 hours will occur during that 2-week period.

This view is a valuable management tool for tracking a resource's work or cost allocation, seeing how costs change over time, and creating timesheets.



You can edit the actual time a resource has worked on a task per day, week, or month.

You can change the fields on the table to include cost, actual work, cumulative work, overallocation, and remaining availability. (You can do this quickly by right-clicking to open the shortcut menu.)

You can change the timescale to show information in different units, such as days, weeks, months, or quarters.

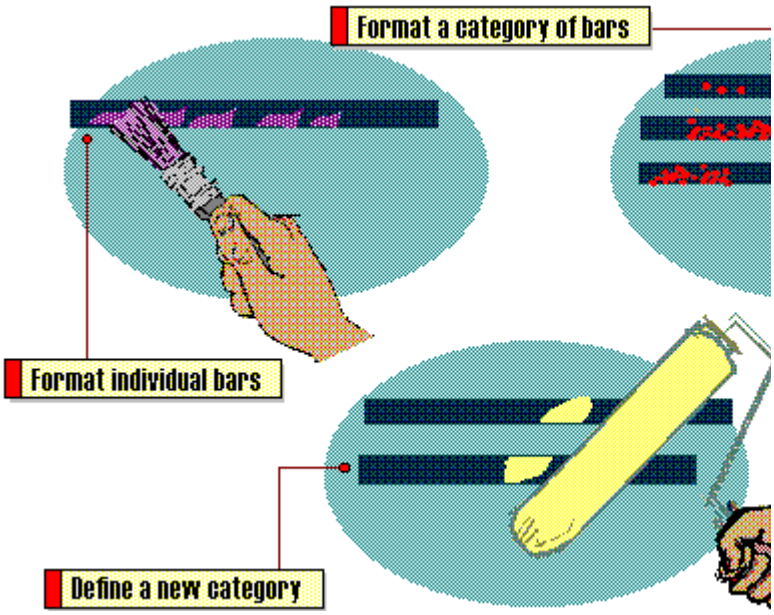
Formatting Gantt bars

You can format the bars in the Gantt Chart with a variety of options to make them look the way you want. The quickest and easiest way to format bars is with the GanttChartWizard (click  on the toolbar). The GanttChartWizard can help you display the critical path, baseline information, or status information.

You can also:

- Change the color, end points, pattern, and line thickness of Gantt bars.
- Display task information next to or inside the Gantt bars.
- Specify the types of tasks to display as bars.

Formatting Gantt bars



You can format individual bars on the Gantt Chart as a useful way to highlight the bars that represent important or significant tasks. Each bar retains the unique formatting you specify until you change it.

You can have Microsoft Project format categories of bars for you. For instance, you could decide to format with yellow all bars representing tasks that are in progress. Then, anytime you mark a task as started, Microsoft Project will automatically change its bar color to yellow, which you can clearly see in your chart.

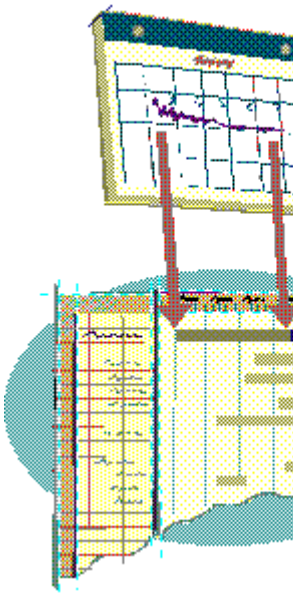
You can format a category of bars that aren't defined by default. For instance, you can display the bars of all tasks that started late with red stripes. Microsoft Project will automatically change the color of all tasks that started late.

Formatting Gantt bars

When you define a bar style, you specify the bar's name, the way it looks, and the type of tasks it represents. Microsoft Project displays the same bar style for every task that matches the criteria you specify.

You also specify what dates to

begin and end with. For example, you might begin using the bar style at the actual start of the task and display it through percent complete. When the task becomes 50 percent complete, half the bar will be formatted with the new bar style you defined.

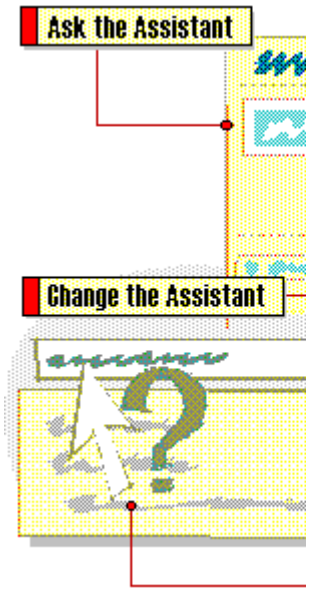


Choosing the right view

Formatting Gantt Bars

Getting assistance while you work

The Office Assistant is the best way to get help in Microsoft Project. Use the Assistant to find answers to your questions, explanations of problems, and tips on working with Microsoft Project. Like an expert who sits right next to you, the Assistant is always available to answer your questions and help you get your work done.



You can click the Office Assistant at any time to get help with a question. To get the best possible answers, your questions should be specific and contain more than one or two words. The more words you use, the better your chance of getting the information you want. For example, to get help printing a legend on a chart, typing **printing** will not produce as good an answer as typing **how do I print a legend on a chart?**

You can make the Office Assistant fit the way you work. You can choose to have the Assistant display alert messages, provide tips, make sounds, or move out of the way. If you have Office 97 installed, you can even choose from a gallery of Office Assistant characters including Clippit, Mother Nature, or Hoverbot to find one that best fits your style.

ScreenTips show information about different elements on the screen. To see ScreenTips:

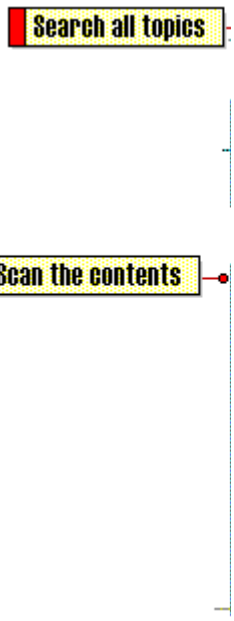
- In any dialog box, click the question mark and then click the item you want help on. If the dialog box doesn't have a question mark, press

SHIFT+F1.

- For screen elements, click **What's This?** on the **Help** menu, and then click the element you want help on.

Getting assistance while you work

You can browse or search the entire contents of Microsoft Project Help by using the Contents, Find, and Index tabs in the Help Topics dialog box.



If you're new to Microsoft Project, you can get assistance by:

- Using the Quick Preview for a short but comprehensive overview of the features in Microsoft Project.
- Working with the Getting Started tutorial to create your first project with step-by-step instructions.
- Using Microsoft Project 101: Fundamentals to learn more about project management.
- Using the Visual Map for a concise overview of the steps involved in creating a project.

Use the Contents tab as you would a table of contents in a book. You can scan the section and topic headings to find the information you need. If you're new to Microsoft Project, scrolling through the contents is a good way to get a feel for Microsoft Project and its terms.

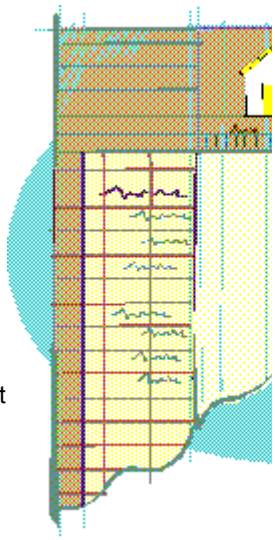
You can search for topics that contain certain keywords by using the Index tab. Using the index is a quick way to find topics that are specifically linked with important concepts or words. Use this tab if you already know basic project management terms.

You can use the Find tab to search through all topics for references to a subject. The Find tab performs a full-text search on all topics in Help. You will generally find a large set of topics from which to choose. When you're not sure exactly what you need, using the Find tab is a good way to look for information.

Using Microsoft Project and the Web

Microsoft Project puts the communication potential of the World Wide Web at your fingertips with a variety of built-in Internet and intranet features. With Microsoft Project, you can take advantage of the power of the Web by:

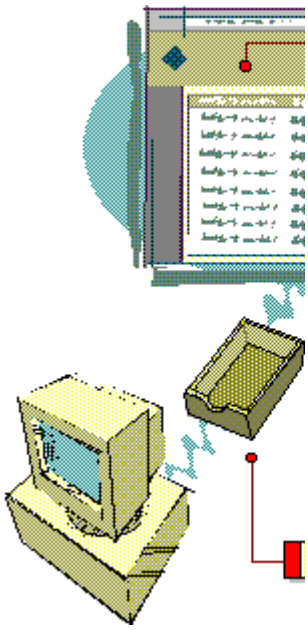
- Communicating project plans and collecting project information from team members. Anyone with a Web connection can communicate with you.
- Distributing documents on the Web related to your project. Microsoft Project can automatically save project files in Web (HTML) format.
- Creating hyperlinks in your project file that jump to documents on the Web, on your local network, or on your own hard drive.



Using Microsoft Project and the Web

You can use Microsoft Project's workgroup communication features on the World Wide Web or your organization's intranet to keep your team informed and up-to-date. Anyone who is connected to a web can exchange project information efficiently and effectively.

Managers use the WebInbox and team members use the TeamInbox to share project and status information.



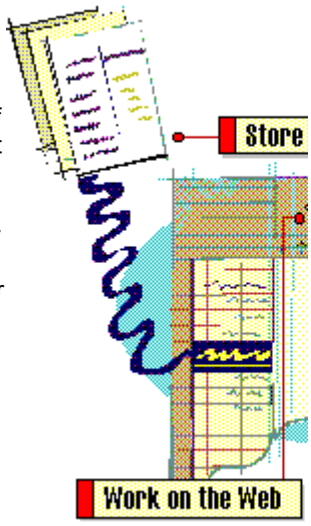
When using the Web to communicate, each team member can log on to the TeamInbox to receive and reply to messages about their work on the

project. While in the TeamInbox, a team member can view a list of their tasks or send status information. The TeamInbox can be either on the Web or on your organization's intranet.

As the project manager, you have a separate inbox in Microsoft Project, called the WebInbox, where project status messages from your team are stored. By accepting the changes in WebInbox messages you can automatically update the project file. You can easily open this password-protected inbox by clicking the WebInbox button on the Workgroup toolbar.

Using Microsoft Project and the Web

Microsoft Project makes using the Web easy and efficient. You can display the Web toolbar, which puts Internet commands within easy reach. The Microsoft Project Web toolbar is easy to learn, especially if you use Microsoft Office, because it works the same way as the Web toolbar in other Office programs.



You can also add hyperlinks to your project to provide quick access to important documents and save your project information as an HTML document to publish on the Web.

Project teams often generate numerous related documents. You can store these documents on the Web or your local intranet and create hyperlinks to them within your project. By clicking these links, you can jump to these documents and view them on the Web.

Like other toolbars, you can display the Web toolbar at any time. The Web toolbar also appears automatically when you click a hyperlink in your project.

Using the toolbar, you'll be able to perform basic Web operations, such as adding favorite Internet addresses, moving through Web pages or Microsoft

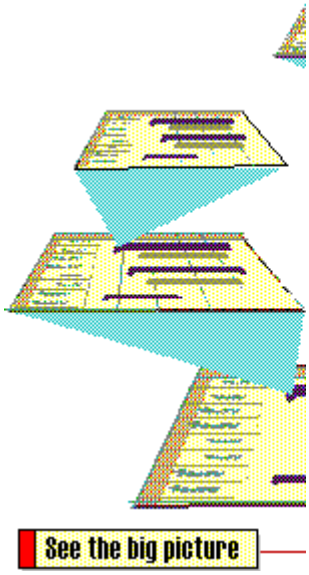
Office documents, and conducting Web searches.

With the Save as HTML command, you can quickly convert information in Microsoft Project to a format that can be published as a document on the Web. Use the default template or create your own to convert just the project information you need to distribute. You can easily attach image files so that your charts will also display on the Web, and any hyperlinks in your file are automatically converted so that they work in the new Web document as well.

Organizing large or complex projects

One of the best ways to organize large or complex projects is by using consolidated projects. You create a consolidated project by inserting one project into another. The inserted project then appears as a summary task in the consolidated project, which can contain one or more inserted projects.

Combining projects in this way gives you more control of projects with a large number of tasks because the project you use most often, the consolidated project, is smaller and easier to work with.



Consolidated projects let you keep the number of tasks you see and track at a manageable level. If you need to see more information about a task, you can quickly drill down to the details by clicking the summary task that represents the inserted project.

You can quickly recognize inserted projects by the inserted project icon  in the Indicators field.

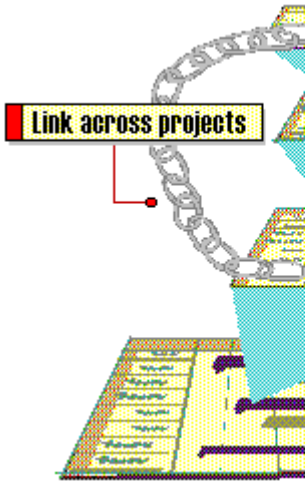
You can see the effects of changes on your project tasks and milestones more easily using consolidated projects,

because you have fewer tasks to monitor.

For example, a programmer might need more time to complete a product feature. Because you have the programming schedule inserted in the consolidated project, the release date for the entire product changes in the consolidated schedule.

Organizing large or complex projects

Consolidated projects are powerful, yet flexible. You work with them the same way you work with individual projects. You can create links, format information, and collapse and expand tasks exactly as you would with an individual project.



To help organize project information, you can also create cross-project links and a hierarchy of projects within your consolidated project.

You can organize your project into a hierarchy to better see how the different parts fit together. Each consolidated project in the hierarchy contains links to the inserted projects below it and is connected as an inserted project to the one above it. This way, you can isolate and manage smaller chunks of your project with greater efficiency.

You can create a link between tasks in two separate projects. The created link works the same as a link between two tasks in the same project. Using cross-project links, you can create more realistic and more intricate project plans.

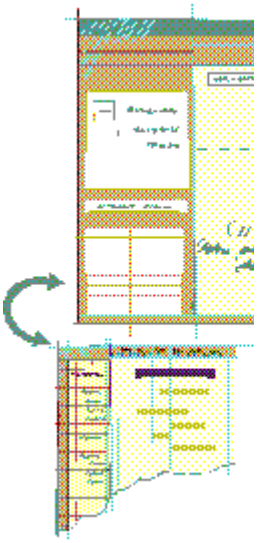
For example, you could link the completion of a feature's design in the product design schedule to the start of the feature's written description in the marketing materials schedule.

Making Visual Basic work for you

Microsoft Project includes a powerful and easy-to-use programming language called Microsoft Visual Basic for Applications. You can use Visual Basic for Applications to record or create simple macros or to build complex programs. Either way, this flexible programming language can help you be more efficient and more productive.

Using Visual Basic for Applications, you can:

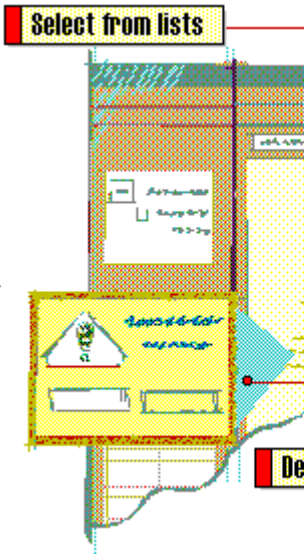
- Automate time-consuming, everyday tasks.
- Integrate Microsoft Project with Microsoft Office and other programs to make it easy to exchange data with them.
- Change the look of Microsoft Project to suit your skill level.
- Simplify collecting and distributing reports and information.



Making Visual Basic work for you

You'll find the updated version of Visual Basic for Applications included in Microsoft Project to be easy to learn and easy to use. The online Help and enhanced editing features can get you started writing macros even if you've never done any programming before.

To use online Help for Visual Basic for Applications, you must first install it. If you didn't install Visual Basic Help during the initial setup of Microsoft Project, you can rerun the Setup program to install it at any time.



Writing Visual Basic code has never been easier. You can select properties and methods from lists that appear right where you're working. You'll see the syntax of statements in line and be able to see whether arguments are required or optional.

With the enhanced Visual Basic Editor included in Microsoft Project, it's easier to

find and fix mistakes in your code. The Visual Basic Editor's debugging messages point out where problems appear in your code and explain how to resolve them.

Getting assistance while you work

Using Microsoft Project and the Web

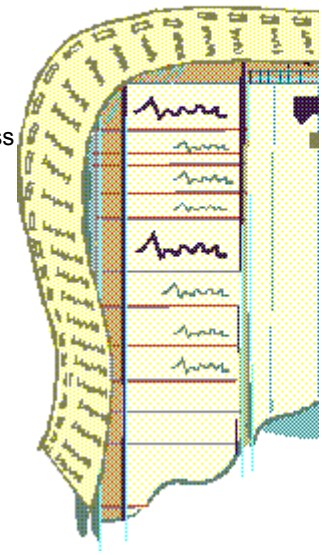
Organizing large or complex projects

Making Visual Basic work for you

Organizing tasks by outlining

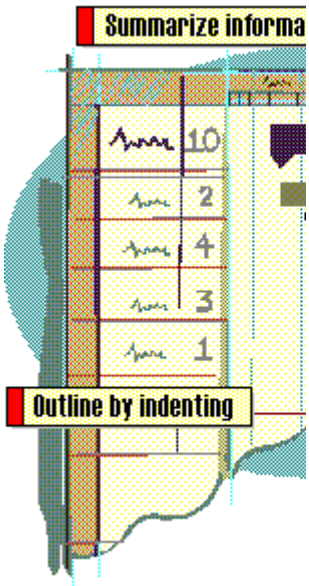
Get organized by outlining your task list to create a hierarchy and summarize related tasks. You can outline all or just part of your task list. You might use outlining to:

- Make a long task list easier to read.
- Divide your project into distinct phases, so you can track progress easily.
- Create a high-level picture of the project for your manager to review.



Organizing tasks by outlining

Just as the table of contents in a book shows chapters and subheadings, an outlined task list shows summary tasks and subtasks. Summary tasks are phases or other major steps in the project. Subtasks are subordinate tasks that must be done as part of that phase or major step.



Summary tasks consolidate information about their subtasks. For example, Microsoft Project calculates a summary task’s cost by adding the costs of all its subtasks. The summary task's duration is the shortest time within which all of its

subtasks can be completed.

Microsoft Project calculates summary task information and updates it when subtask information changes, so the summary task always reflects the latest status of its subtasks. Because the purpose of a summary task is to consolidate information about its subtasks, avoid assigning resources to summary tasks, constraining them, entering costs for them, and so on.

You outline by indenting tasks under another task. The indented tasks become subtasks. The unindented task above becomes their summary task. You can also outdent a subtask until it changes into a summary task.

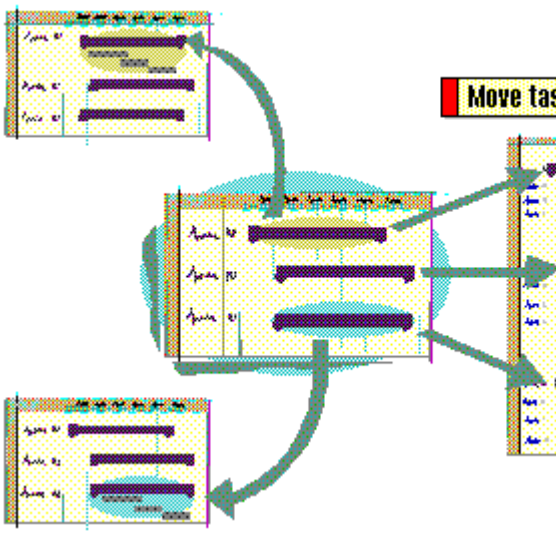
For each summary task you create, Microsoft Project displays a ⊟ next to it and displays a summary bar in the Gantt Chart.

You can indent up to 65,000 levels, creating summary tasks that contain other summary tasks. For example, the summary task “Prepare descriptive labels” might contain several subtasks, including the summary task “Conduct research,” which itself contains subtasks.

Organizing tasks by outlining

Once you’ve outlined your plan, you can review just the tasks you want, at the level of detail you want. You can collapse and expand portions of your plan by showing or hiding the subtasks under their summary tasks.

For example, if you created summary tasks for each phase of your project, you can make an executive summary by hiding subtasks so that only the phases are displayed. By allowing you to focus on and manipulate related tasks, outlining makes it easier to review, track, and change a plan.



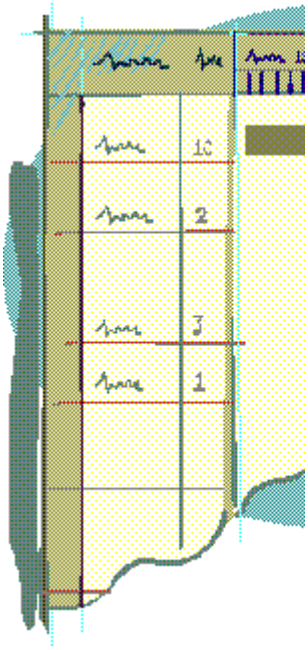
You can easily move sets of tasks by selecting and moving summary tasks. When you cut or move a summary task,

all of its subtasks are also cut or moved simultaneously.

Make a task start or finish when I want

When you first enter a task, its start date is, by default, the project start date. Later, you may link the task to related tasks. You'll most likely use a finish-to-start dependency, in which another task must finish before this task can start. After you link a task, Microsoft Project sets its start and finish dates, based on the dependency.

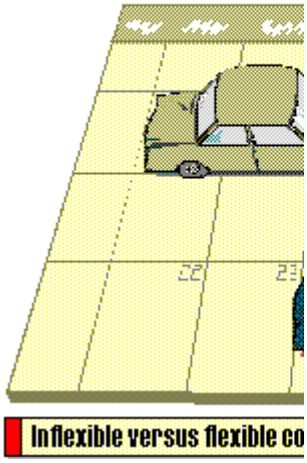
By default, tasks start as soon as possible. If necessary, you can constrain a task so that it starts as late as possible or starts or finishes on or near a specific date. Constraining tasks can limit Microsoft Project's ability to reschedule tasks, for example, by starting them earlier. Therefore, only constrain a task to reflect a real-world time constraint.



Tying tasks to specific dates

By default, as you enter tasks, Microsoft Project schedules them to start as soon as possible, based on the task information you enter.

Sometimes, however, you need the schedule to reflect a real-world time constraint. You can constrain a task so that it starts or finishes on or near a specific date or starts as late as possible. Constraining tasks restricts Microsoft Project's ability to schedule, so only constrain a task when it's absolutely necessary.



You can set constraints to work in one of two ways. They can:

- Restrict Microsoft Project so that it cannot reschedule a constrained task’s dates.

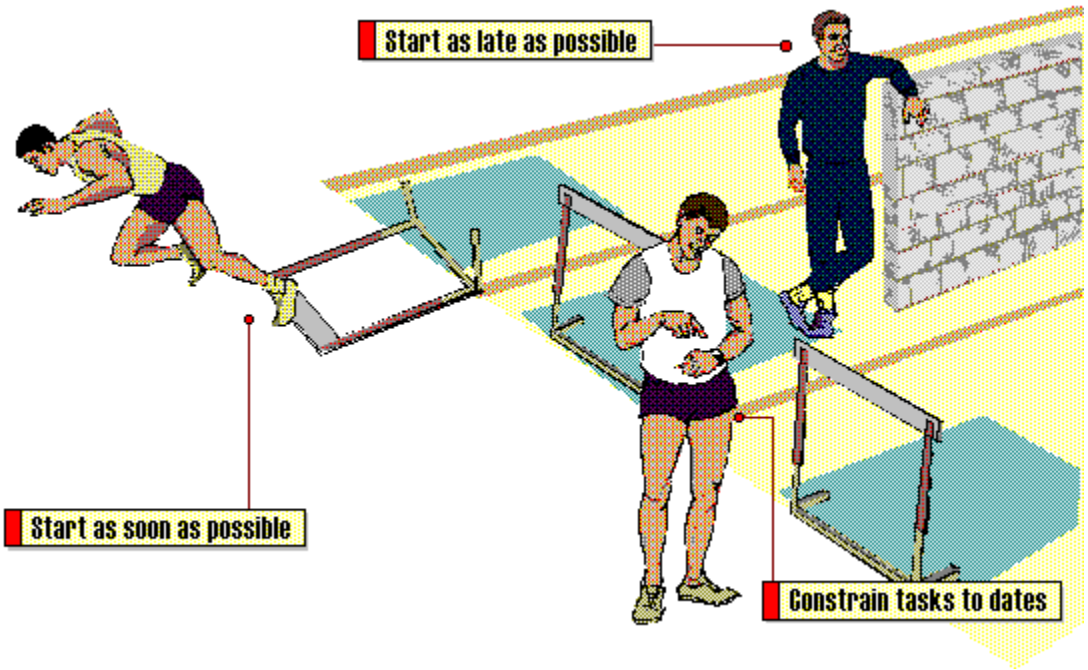
This is called an inflexible constraint.

- Allow Microsoft Project to reschedule constrained tasks, but notify you when it does so. As a result, you always know when a task cannot meet the constraint you set. This is called a flexible constraint.

If possible, use flexible constraints so that Microsoft Project can adjust your schedule to reflect changes you make to it or the actual progress of tasks.

Be careful not to constrain tasks that are dependent on other tasks. Doing so can artificially handicap Microsoft Project's scheduling abilities. For example, the task “Pour foundation” is linked so that it starts as soon as “Dig hole” finishes, which is supposed to happen on the 10th. If you enter an inflexible constraint that forces “Pour foundation” to start on the 10th and “Dig hole” finishes early, Microsoft Project will not be able to take advantage of the early finish and move “Pour foundation” to start earlier.

Tying tasks to specific dates



Most of the time, you'll want to use the default constraint Start As Soon As Possible. Using this constraint, Microsoft Project sets the start date for the task to happen as soon as possible, given the information you enter about it and any related tasks.

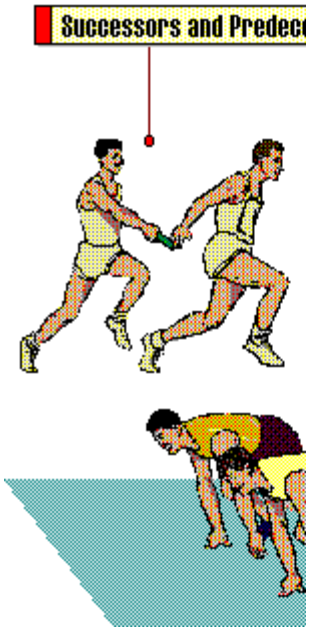
If you need to delay a task's start for as long as you can, use the Start As Late As Possible constraint. Microsoft Project delays the task's start as long as it can without impacting the project's finish date.

You can specify that a task start or finish on a specific date. You can also specify that a task start or finish no earlier or no later than a certain date.

Making tasks happen at the right time

Tasks in a project usually happen in sequence. For example, for a clock museum exhibit, you might prepare the walls, then paint them, and then hang the clocks. By default, when you first enter tasks, Microsoft Project schedules them to begin on the project start date. To sequence your tasks so they happen at the right time, you link dependent tasks and specify the type of dependency they have.

Most often, a task will need to start after another one finishes. At times, two tasks may need to begin at or around the same time. Or, two tasks may need to end at or around the same time.



There are four dependency types available:

- Use a finish-to-start dependency when one task cannot start until another task finishes. For example, you cannot hang the clocks until you have painted the wall. Because this is the most common type of dependency, you can create it quickly with the mouse in the Gantt Chart.

- Use a finish-to-finish dependency when one task cannot finish until another task finishes.
- Use a start-to-start dependency when one task cannot start until another task starts.
- Use a start-to-finish dependency when one task cannot finish until another task starts. This dependency is rarely used.

Usually, Microsoft Project creates a finish-to-start dependency by default, but you can easily change the dependency type.

To create a dependency, you select the related tasks, link them, and then change the dependency type, if necessary.

The task whose start or finish is dependent on another task is called the successor. The task it is dependent on is called the predecessor. For example, if you link "Hang the clocks" to "Paint the wall," then "Hang the clocks " is the successor and " Paint the wall " is the predecessor.

Once the tasks are linked, changes to the predecessor’s dates will affect the successor’s dates. For example, if the predecessor in a finish-to-start link is delayed, the successor’s start and finish dates will also move later.

Making tasks happen at the right time

Sometimes, a task link alone is not enough to accurately show the relationship between tasks. One task may need to start shortly after another starts. Or, a task may need to begin or end a certain amount of time after another task begins or ends.

You can fine-tune task links to reflect these complex relationships by specifying an amount of time by which to offset the tasks. For example, if you've linked "Make the signs" so that it starts with "Get the clocks," you can offset the tasks by 1 day to cause "Make the signs" to start 1 day after you get the clocks.

You offset tasks by linking them and then setting *lag time*. The lag time specifies the amount by which the tasks will overlap or be delayed. For example, to create a 1-day gap after painting and before hanging the clocks, use a finish-to-start dependency and set a 1-day lag time. If you need to start hanging labels 1 hour after clock hanging begins, use a start-to-start dependency and set a 1-hour lag time.

You can also specify negative lag time, called *lead time*. For example, to begin installing the case lights 4 hours before you finish the case installation, use a finish-to-start dependency and a lag time of 4 hours. The two tasks will overlap each other by 4 hours.

Microsoft Project shows task links in the Gantt Chart by staggering the task bars to reflect the task's start and end dates and by displaying a link line between the tasks. From time to time, you'll want to reevaluate your links to optimize the schedule or to resolve problems such as a late finish date or an underused resource. For example, if your project is finishing late, evaluate all of your dependencies and see whether any of the links can be deleted or whether you can add lead time to start tasks earlier.

Organizing tasks by outlining

Make a task start or finish when I want

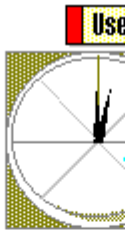
Tying tasks to specific dates

Making tasks happen at the right time

Setting the length of a task

You can indicate how long it will take to complete a task by setting its duration. When you enter a task, Microsoft Project sets its duration to 1 day. If you know the task will take more or less than a day, change the duration.

By default, after you set the initial duration, Microsoft Project automatically adjusts it for you when you change the number of resources assigned to the task or the amount of work they do. For example, if you add resources to a task, Microsoft Project automatically reduces its duration.



When you create a task, estimate how long it will take to complete and enter that estimate as the duration. If you plan to assign resources, consider how long it will take those specific resources to do the task. Then be sure to assign those resources. If you assign different resources or a different number of resources, you may need to change the duration.

Your project may include tasks whose durations won't change no matter how many people are assigned. For example, whether you have one person review your proposal or 10, you'll allow the same 1-week period for the review. You can fix the duration for these kinds of tasks so that Microsoft Project doesn't recalculate the duration when you change resource assignments.

You can enter and display durations in minutes, hours, days, or weeks. Choose the unit that best meets your needs.

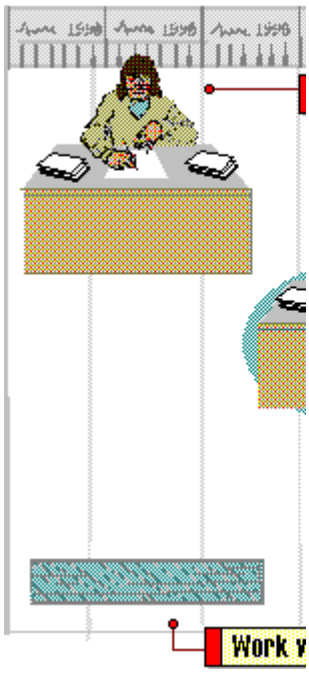
Microsoft Project doesn't schedule work on weekends, holidays, or other nonworking time periods. If you want Microsoft Project to schedule work during nonworking times, enter an elapsed duration. For example, if you enter an elapsed duration of 5 days for a task

starting on Wednesday, the task will finish on Sunday. (Note that resources are scheduled to work on tasks according the settings in their calendars.)

Interrupting work on a task

Sometimes, work on a task is interrupted. For example, a researcher may have left and her replacement won't be able to start for a month.

You can split tasks to indicate periods of time when work isn't being done. If you know there will be interruptions in a task, you can split the task when you create it. If the interruption happens after a task has started, you can split it and use the split to show when work will continue on the remaining portion.

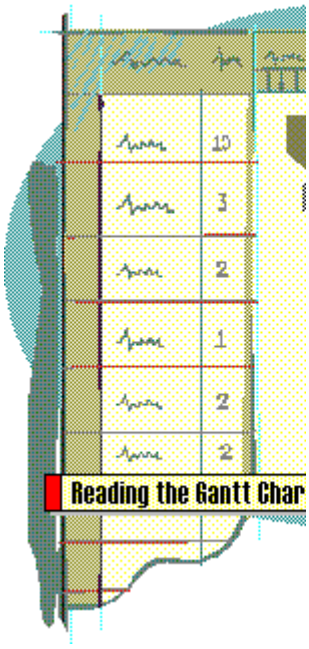


You can split a task as many times as you like and create gaps of any size. When you split a task, Microsoft Project displays a gap in the task's Gantt bar. The width of the gap indicates the length of the interruption. You can drag the split portion of a task bar to a new date to specify when work will begin on that portion of the task. You can also remove the split by dragging the split portion of the Gantt bar back to the previous portion, closing the gap.

If different resources will work on different parts of a task, you can split the task and assign different resources to each portion. For example, to "Prepare labels," one person may write the text. Another person may create a style for the labels and produce them. To reflect this process, you can split the task, then assign the first person to the writing portion and the second person to the production portion.

Understanding the Gantt Chart

The Gantt Chart view displays basic task information in columns and a bar graph. Because the Gantt Chart makes it easy to see the schedule for tasks, most people use this view to build their initial plan, view the schedule, and make adjustments to the plan. If you need to customize the Gantt Chart to meet corporate standards or to highlight information, you can use the GanttChartWizard to do so quickly.



The Gantt Chart view consists of a sheet on the left and a bar chart on the right. By default, each row of the sheet displays the name and duration of a task in the project. By resizing the sheet or scrolling within it, you can see more information about each task.

At the top of the chart is a timeline. Below that are bars representing each corresponding task in the sheet. A task bar's location on the timeline shows when its task starts and finishes. The bar's length indicates the task's duration. As you change information in the sheet, the task bar changes to reflect the change to the task.

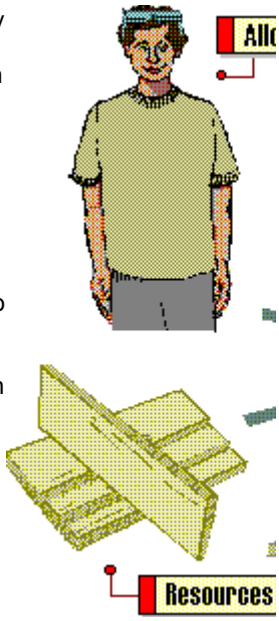
Assign or remove resources

The tasks in your project won't magically get done. You'll need resources to do them. A resource can be a single person or piece of equipment, such as the resource Joe Smith, or it can represent a group, such as Plumbers.

By default, Microsoft Project calculates each task's duration based on the number of resources assigned to it and the amount of the resources dedicated to the task. For example, if you have two full-time people assigned to a 2-day task, and you reduce them to half-time, Microsoft Project sets the task's duration to 4 days.

What do you need to do with resources:

- Assign a resource to a task
- Remove a resource from a task



The amount of a resource assigned to a task is called the resource's *allocation*. The resource's calendar defines the number of hours in a day that constitute full allocation, 8 hours by default. When you assign a resource, you set its units to indicate its specific allocation on a task. By default, resources are fully allocated when assigned to a task, meaning the resource spends 100% of its time (8 hours per day) on the task. Setting the units to less than 100% assigns a person part-time. Setting the units to more than 100% assigns a person to work overtime.

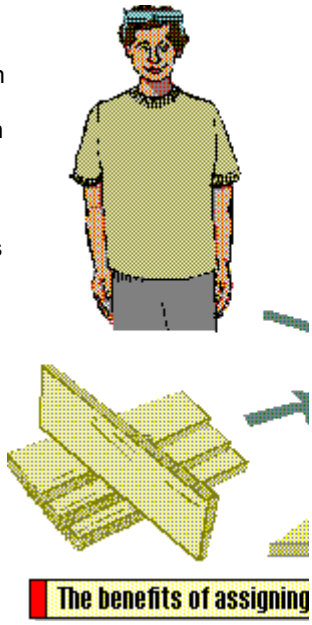
When a resource represents a group, the resource's calendar determines the number of hours that constitute full allocation for one member of the group. For example, if the plumbers work 8-hour days, the calendar for the resource Plumbers sets an 8-hour day.

The units you enter when you assign the resource indicate the number of items from the set that are assigned to the task. For example, if the resource is Wood Planks, setting the units to 100% assigns one wood plank to the task, 200% assigns two wood planks, and so on. If you prefer, you can enter and view units as decimals, such as 1.0, 2.0, and so on.

Associating people and equipment with tasks

The tasks in your project won't magically get done. You'll need resources to do them. A resource can be a single person, such as Joe Smith, a piece of equipment, or it can represent a group, such as Plumbers.

You assign resources in Microsoft Project by indicating which resources will work on each task. You can assign resources to any task and change assignments at any time.

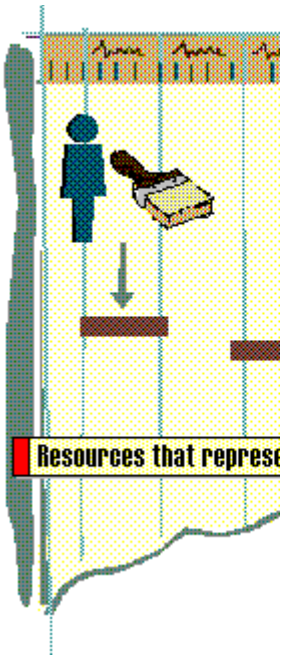


Assigning resources makes your schedule more accurate. By default, Microsoft Project calculates each task duration based on the number of resources assigned to it and their allocation to the task.

In addition, if you assign resources, Microsoft Project can provide information to help you manage them. For instance, Microsoft Project can identify resources that will have to work overtime and tell you how much each resource is costing.

Associating people and equipment with tasks

For scheduling purposes, resources are both the people and equipment assigned to a task and the amount of the resources dedicated to the task, called *allocation*. Allocation affects a task's duration. For example, if you have two full-time people assigned to a 2-day task, and you reduce them to half-time, Microsoft Project sets the task's duration to 4 days.



You set resource units to indicate allocation. By default, resources are fully allocated, meaning the resource spends 100% of its time on the task. Setting the units to less than 100% assigns a person part-time. Setting the units to more than 100% assigns a person to work overtime.

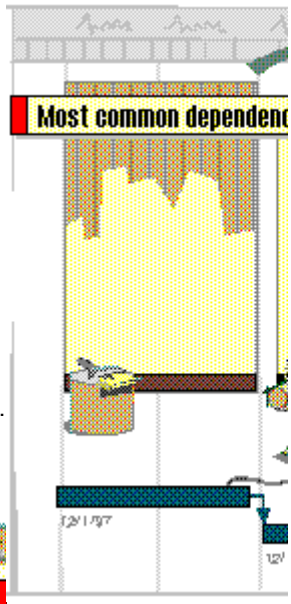
The resource's calendar defines the number of hours that constitute full allocation. For example, if a resource's normal working day is 8 hours, then 100% units is 8 hours per day, 150% is 12 hours per day, and 50% is 4 hours per day.

When a resource represents a group, its calendar sets the number of hours that constitute full allocation for one member of the group. For example, if the plumbers work 8-hour days, the calendar for the resource Plumbers sets an 8-hour day.

The units indicate the number of items from the set that are assigned to the task. For example, if the resource is Plumbers, setting the units to 100% assigns one plumber to the task, 200% assigns two plumbers, and so on. If you prefer, you can enter and view units as decimals, such as 1.0, 2.0, and so on.

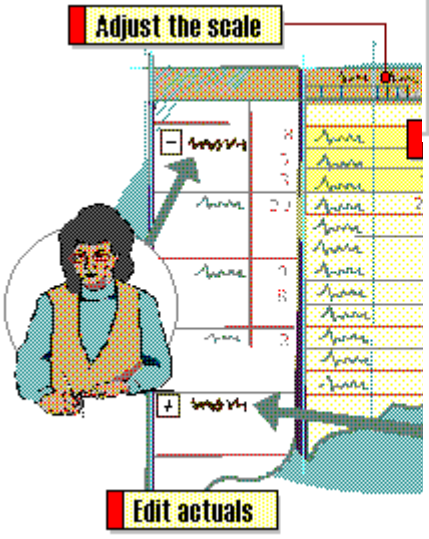
Create or remove task links

Tasks in a project usually happen in a specific sequence. For example, you prepare the walls, paint them, and then hang the clocks.

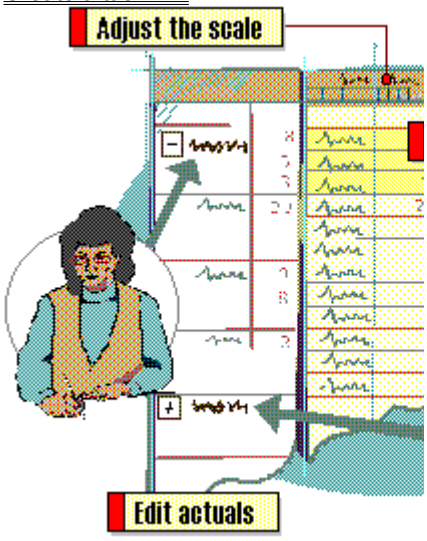


When you enter a task, Microsoft Project schedules it to begin on the project start date. To sequence tasks so they happen at the right time, you link dependent tasks and specify the type of dependency they have. Microsoft Project then schedules the tasks by setting the start and end dates, staggering the Gantt bars to reflect the new dates, and displaying link lines between the dependent tasks.

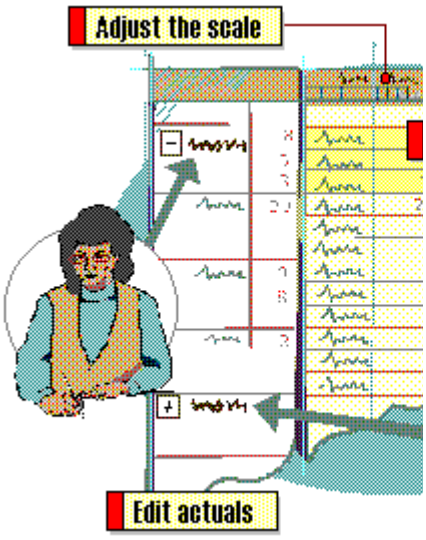
What do you need to do with links:



Create a task link



Remove a task link



Change a task link

Most of the time, one task cannot start until another task finishes. This type of relationship is called a finish-to-start dependency. For example, you cannot hang the clocks until you paint the wall. Because this is the most common type of dependency, it is the default dependency when you create a link.

Microsoft Project provides four types of dependencies:

- Finish-to-start dependency, in which one task cannot start until another task finishes.
- Finish-to-finish dependency, in which one task cannot finish until another task finishes.
- Start-to-start dependency, in which one task cannot start until another task starts.
- Start-to-finish dependency, in which one task cannot finish until another task starts.

Only link tasks when the start or finish of a task is truly dependent on the start or finish of another task.

Sometimes, a task link alone is not enough to accurately show the relationship between tasks. You can fine-tune dependencies by specifying an amount of time by which to offset them, called lag time. For example, to delay hanging the clocks for 1 day after painting, set a finish-to-start dependency and then add 1 day of lag time.

To overlap tasks, you can specify negative lag time, called lead time. For example, to begin installing the case lights 4 hours before you finish the case installation, set a finish-to-start dependency and then add a lag time of negative 4 hours. The two tasks then overlap each other by 4 hours.

Setting the default start date for tasks

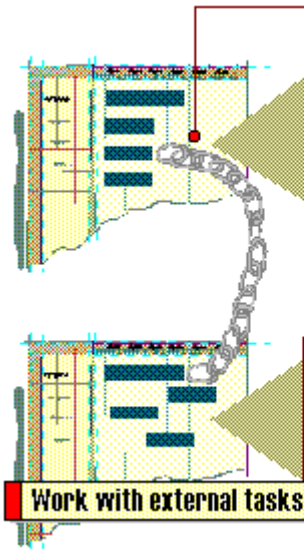
You indicate when you first expect tasks to begin by setting the project start date. As you enter tasks, Microsoft Project schedules them to start on that date. Of course, every task won't start immediately. So, as you enter more information about tasks, such as dependencies or constraints, Microsoft Project sets more realistic start dates.

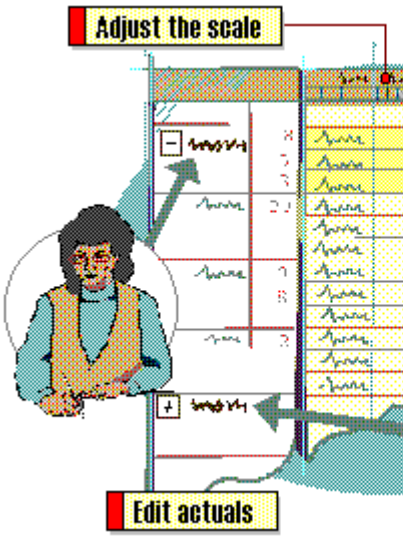
If your tasks aren’t starting by default when you want them to, you can change the project start date. Microsoft Project will reschedule the start date of any task that is not dependent on another task or constrained to a specific date.

Establishing dependencies between projects

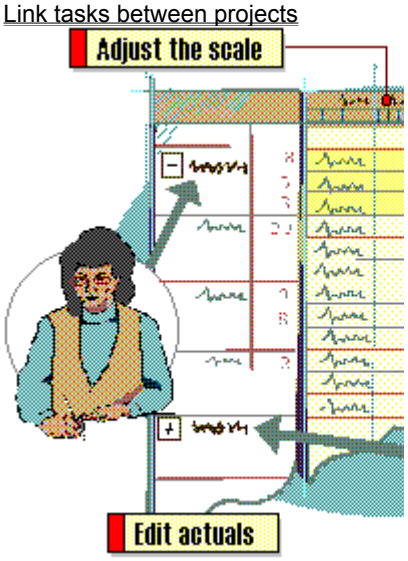
If you have several related projects in which tasks in one project are dependent on tasks in another project, you can link the tasks. You can link tasks between projects within a consolidated file or link tasks between separate, but related projects.

What do you want to do?





Link tasks between projects



Change the dependency between tasks in different projects

When you link tasks between projects that are part of a consolidated project, the task links appear as standard links. If you link tasks in two separate projects, however, Microsoft Project displays an external task in each project to represent the linked task. The external task is an uneditable copy of the linked task.

For example, say that you link "Build display clock tower" in the Construct project so that it has to start after "Create exhibit specs" in the Design project. When you open the Design project, you'll see an external task "Build display clock tower" linked to "Create exhibit specs," and vice versa when you open the Construct project.

You can use the Task Properties dialog box to see information about an external task. You can change the dependency link for an external task by double-clicking the task linked to it. You can double-click the external task to go to the project that contains the external task and work with the task.

Setting the length of a task

Interrupting work on a task

Understanding the Gantt Chart

Assign or remove resources

Associating people and equipment with tasks

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Establishing dependencies between projects

Sharing resources between projects

Do you manage more than one project, but staff the projects with some of the same resources? With Microsoft Project, you can share resources across project files from a single resource pool. By grouping all your resources into a common resource pool, you can:

- Review resource usage and costs across projects.
- Quickly add shared resources to a new project.
- Identify and resolve resource overallocations.
- Print resource reports about usage across projects.

Project files need not be linked or consolidated in any way to create a common resource pool.

Large, complex projects usually involve many resources. If your project requires multiple project files and many resources, you can model your plan more efficiently by using a single resource pool. You can also more easily assess resource availability and track resource costs and usage with fewer surprises.

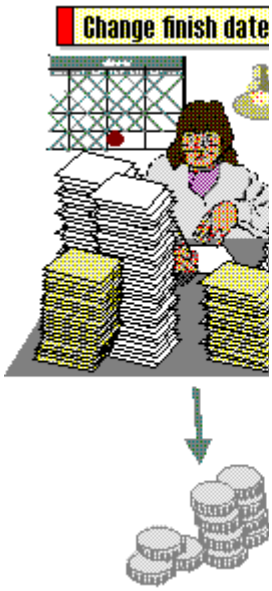
Once you create a resource pool, Microsoft Project handles the sharing between project files without you having to open all related files. You'll be able to save changes to the pool when anyone enters new information.

The resource pool file requires no setup or maintenance. You can save your resource pool file every time you enter resource information so that you have the latest data about all the resources in the entire project. Anyone using the pool can access the same data, increasing the real-world usefulness of your project plan.

Resolving resource overallocations

Sometimes there's just too much to do and not enough time.

Overallocations can result from schedule changes or from assigning a resource to work full-time on more than one task. Resources are overallocated when they are scheduled to do more work than can be accomplished in the specified time. You can quickly see overallocated resources in the Resource Usage view, where they are in red.



To resolve overallocations, you need to decide which of these factors you can change:

- The finish date of the task or project
- The resources assigned to the task
- The cost of the task

If your schedule will allow changes to task finish dates or to the project end date, you can use that flexibility to resolve overallocations.

- If an overallocated resource is working on only one task, allocate less of that resource's time to the task.
- If a resource is working on two or more tasks, decide which tasks you can delay with the least impact on your schedule until the resource is available to work on them.

If you have other resources available, you can change assignments to resolve the overallocation without changing the task completion date. You can:

- Add more resources to the task to keep it on schedule.
- Reassign some or all of the work to more efficient resources who might be able to get more work done in the same amount of time.

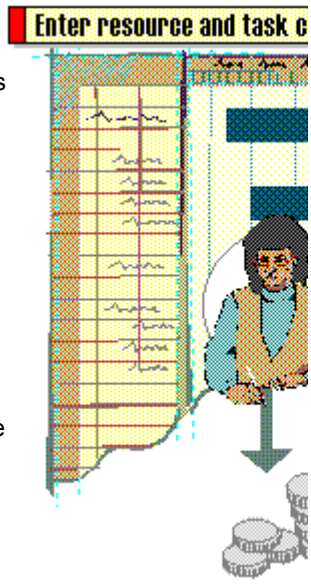
If you cannot change the finish date, you might be able to resolve an overallocation by absorbing some additional cost to complete the task. You can:

- Reset the maximum units for multiple resources to add more resource time to the task.
- Increase a resource’s working hours, adding overtime costs, to keep the

task on schedule.

Entering and tracking cost information

Understanding costs can be an important part of project scheduling for you as a project manager. Microsoft Project can help you with budgets and offers a variety of ways to enter and track some or all of your project costs.



Based on the fixed costs or resource costs you assign, Microsoft Project calculates the costs for each task and the project as a whole.

The Cost table is the best place to review general project cost information, while the Resource Usage and Task Usage views can help you see project costs over time in detail.

You can enter cost information for each resource and task. For resource costs, you can enter the pay rates or per-use cost and set the accrual method. For tasks, you can assign a fixed cost or assign a resource that has a cost.

If you want to keep track of a budget for your entire project, you'll need to save a baseline after you enter initial project data and before you begin entering actuals.

Microsoft Project automatically totals your project costs based on the actual work information you enter for each task or resource. Then you can review the total project costs to see whether you're staying on budget.

Entering and tracking cost information

In Microsoft Project, you can record costs for both resources and tasks.

You can enter three types of resource costs: standard rates, overtime rates, or fixed, per-use costs. During the project, Microsoft Project calculates resource cost

based on how much of a task is completed. For tasks, you can enter a fixed cost, which stays the same no matter how long the task takes.

You can enter new pay rates or fixed costs at any time. Microsoft Project takes the new rates into account in its calculations. You can also assign different pay rates or fixed costs for the same resources depending on the task or the time period.

You can set different rates for the same resource.

- If a resource does more than one kind of work, you can pay the resource at different rates depending on the task. For example, you might pay a carpenter more for doing finish work than framing.
- You can specify that a rate change at a certain time. For example, if you know a resource will get a pay increase in 6 months, you can have Microsoft Project automatically start using the new rate at the time you designate.

A resource cost may increase when a task takes more time, but a fixed cost does not.

For example, if a carpenter is paid hourly and is scheduled to complete a task in 5 days, but the task takes 7 days, the carpenter will be paid more than planned. If the carpenter is paid a fixed cost for the work, then the cost will be the same no matter how long the task takes.

A resource can have a one-time cost every time you use it. For example, rental equipment might have a delivery or setup charge every time it is used, in addition to an hourly charge.

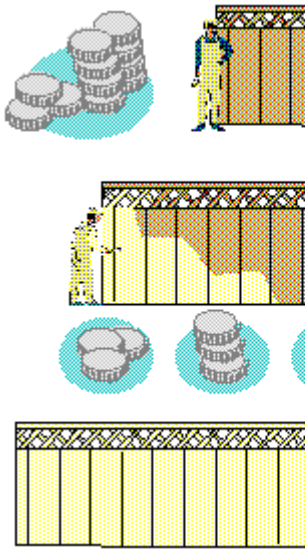
Entering and tracking cost information

A key part of tracking your project's budget is knowing how your costs are accruing, or accumulating, over time. You can track cost information more effectively by using the right accrual method. For example, you can:

- Accrue the cost of a task when it

starts if you have to pay it as a lump sum before any work begins.

- Prorate the cost of a task if you need to track the cost based on how much of the task is completed.
- Accrue the cost of a task when it ends if you're holding payment until the work is finished.



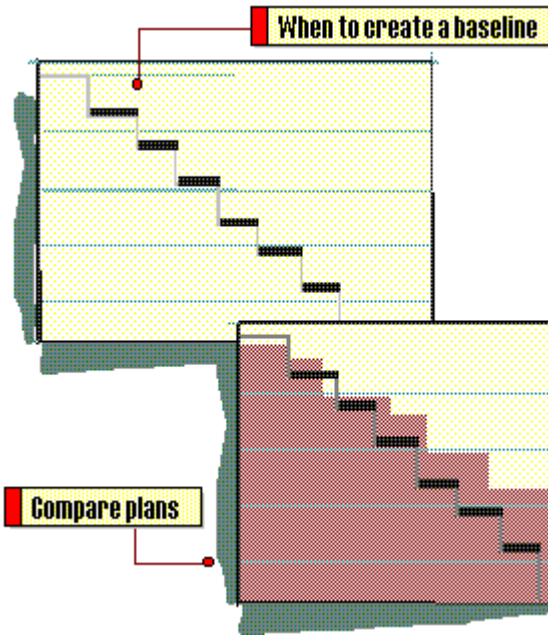
Sharing resources between projects

Resolving resource overallocations

Entering and tracking cost information

What is a baseline?

Every project is a learning experience. To make the most of your experience, create a baseline plan that represents your expectations for the project. Then, if you track actual progress in Microsoft Project, you can use the baseline to compare your original plan for the project with the actual course of the project. You can see which tasks started earlier or later than planned, exceeded their original budget, took longer than planned, and so on. You may be able to use this information to prevent problems on future projects and make better time and budget estimates.



Ideally, you create a baseline by saving your project plan after you've polished it and just before you actually start work on the project. If you want to track project costs, be sure to enter cost information before you create the baseline.

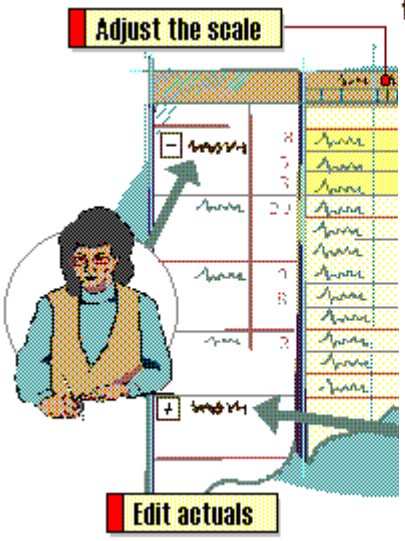
If you save a baseline and then find you need to make adjustments to it, you can easily add new tasks or make changes to existing tasks in the baseline.

At any time, you can compare your baseline plan with actual progress to date by using the Tracking Gantt view. If you want to compare your original budget for the project with the actual costs of the project to date, use the Cost table in the Task Usage view.

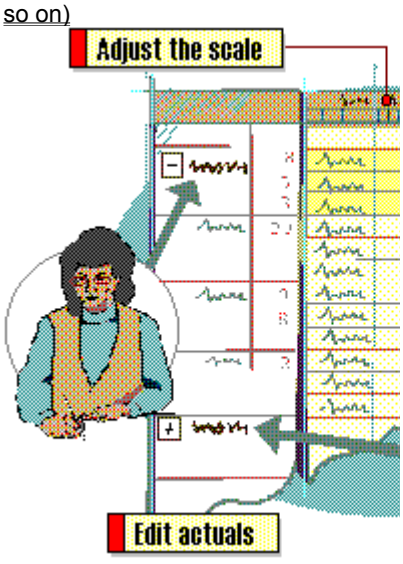
Making a view look the way you want

Occasionally, you may want to format a view to better meet your needs. For example, you may want to highlight milestones, change the colors of task bars to match corporate standards, or change column titles to match your organization's terminology. You can easily tailor views and even save the modified views for later use.

What do you want to format?



A chart (Gantt Chart, Calendar, and so on)

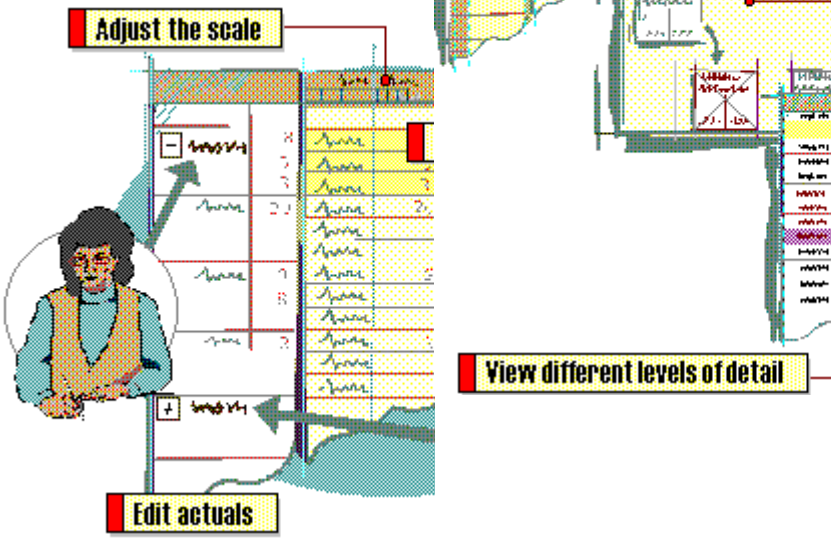


A sheet (Resource Sheet, Task Usage, and so on)

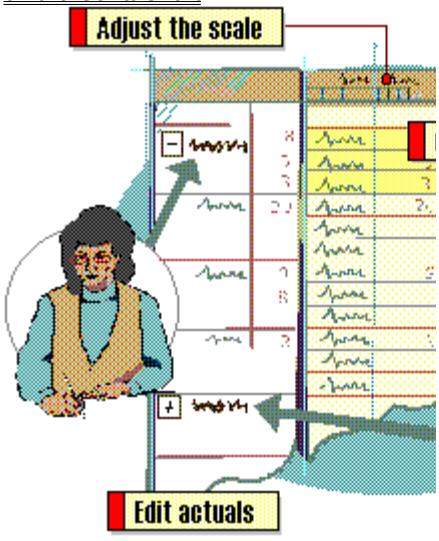
Making a view look the way you want

You can change the look of charts in many different ways. For example, you can change the look of bars and boxes, change the way nonworking time displays, and change the appearance of the connections between bars or boxes.

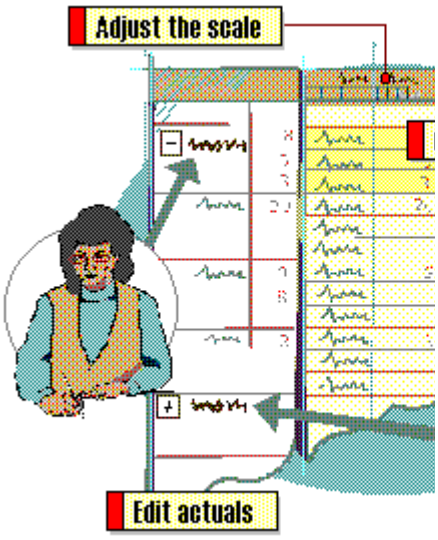
What do you want to change?



The appearance of bars and link lines on the Gantt Chart



The appearance of boxes on the PERT Chart



The timescale to see a different level of detail in a view

You can change the color, pattern, and size of the Gantt bars for different types of tasks. For example, you might make summary task bars yellow or use a dashed line to indicate actual progress on tasks.

You can display task information next to Gantt bars. For example, you might display each task's name and start date next to its Gantt bar. You can also change the look of the link lines connecting dependent tasks or even hide the link lines entirely.

You can change the set of information that appears in PERT boxes. For example, you can have each task box display the percentage of the task that has been completed and the actual start date of the task.

You can also change the color and line style for different types of task boxes. For example, you might display milestone tasks in blue boxes with thick lines around them.

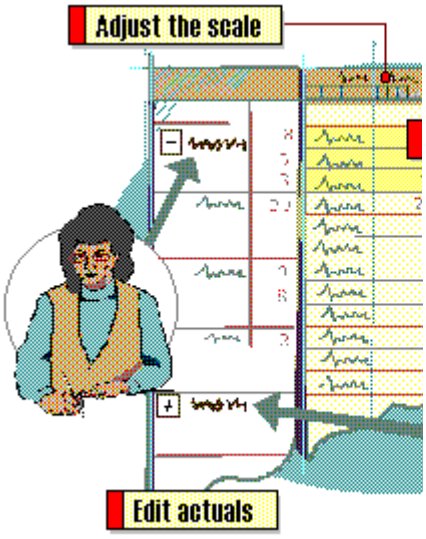
In most chart views, you can use the timescale that appears at the top of the view to see a high-level picture or a more detailed picture of the chart's information. For example, in the Gantt Chart view, you

can change the timescale to show the quarterly schedule for tasks over the next several years. Microsoft Project changes the units displayed in the timescale to years over quarters and makes the task bars smaller to fit this scale. If you want to see more detail, you can change the timescale to days over weeks to see the task schedule for each day.

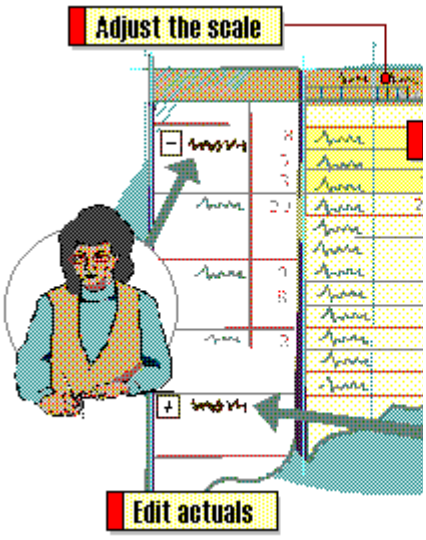
Making a view look the way you want

As in Microsoft Excel, you can change the format of sheet views in a variety of ways. For example, you can change the title of column headings to match your organization's terminology, or change the width of columns to display long task names. You can also use different fonts for text in the sheet, as well as different font sizes and text colors.

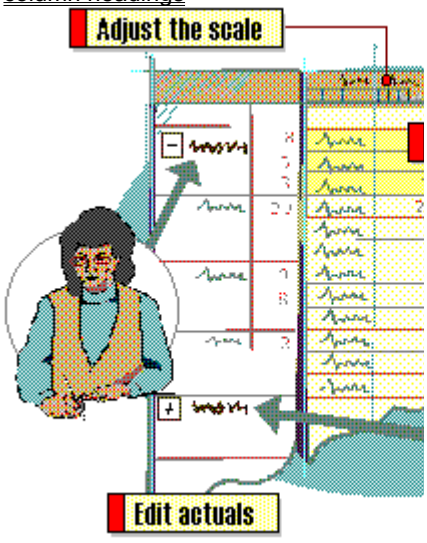
What kind of sheet formatting do you want to do?



Change the appearance of text



Change the appearance of text in column headings

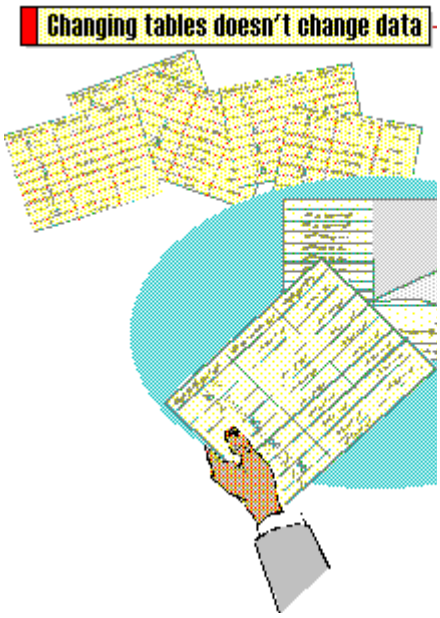


Change the appearance of columns and rows on the Gantt Chart

Changing the columns in sheets

Sheets present information in rows and columns. Each row displays information about a different task or resource, and each column displays a different piece of information about the task or resource. Tables control the set of columns that display.

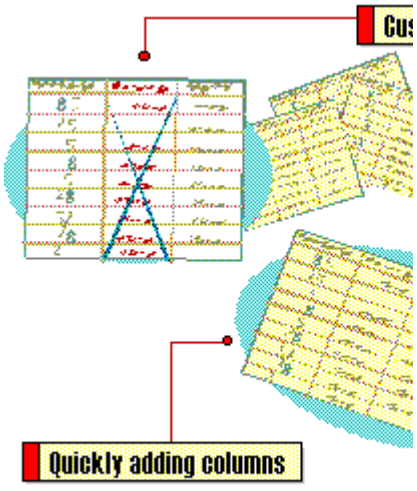
Microsoft Project applies a default table to each view, but you can switch the view's table. For example, the default table for the Gantt Chart view displays basic columns of information about tasks, such as their name, duration, and start and finish dates. By applying the Cost table instead, you can see columns of cost information, such as fixed costs and total costs.



Changing tables does not delete information. When you apply a new table, Microsoft Project temporarily hides some information and displays other information. For example, if you switch from the Cost table (which displays information about costs) to the Entry table (which displays basic task information) the cost information is still stored in the Microsoft Project database, and you can redisplay that information at any time.

Changing the columns in sheets

For each view, Microsoft Project provides predefined tables that you can easily apply. Each of these tables displays columns of information that are useful for performing a certain type of project work. For example, the Tracking table is useful for tracking the progress of tasks. The Hyperlink table is useful for working with project information stored on the Internet or your company's intranet. Note that a different set of predefined tables is available for task views than for resource views.



You can modify tables to better meet your needs. For example, if you check costs frequently, you can edit the Gantt Chart's default table, the Entry table, to include cost columns. Note that when you delete a column from a table, you don't actually delete the information that was stored in the column.

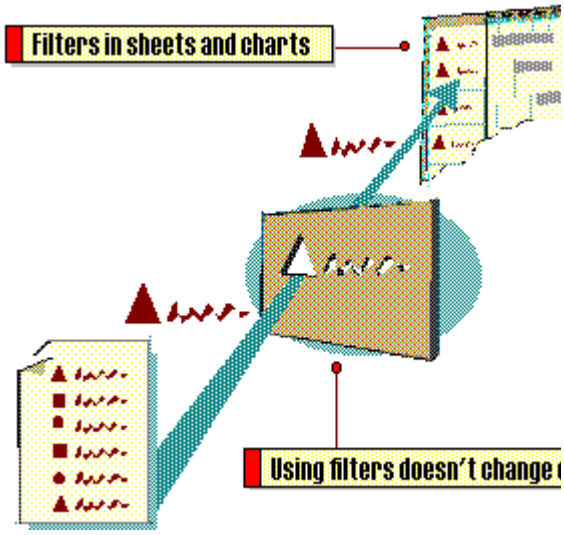
You can copy tables and modify the copies to create your own tables. Or, you can create custom tables from scratch.

You can quickly and easily modify a table by adding columns to it. When you insert a column in a sheet view, Microsoft Project adds the column to the currently applied table in that project. Thereafter, whenever you open the project, the table you modified includes the added column.

Using filters

Sometimes, you need to focus on a specific set of tasks or resources. For example, you may want to review the costs for a specific contractor or evaluate just the tasks on the critical path.

Filters allow you to do this by defining a set of criteria that tasks or resources must meet in order to be displayed or highlighted. You can use filters to modify a view so that it highlights specific tasks or resources or displays only specific tasks or resources, hiding all others.



You can apply filters to views that display information in a sheet or a chart. In sheets, filters determine the rows that are displayed. (They do not affect which columns are displayed.) In charts, such as the Calendar view, filters determine the bars that appear in the chart.

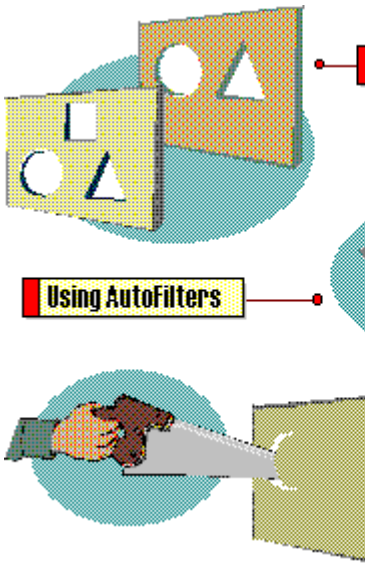
Applying a filter does not delete any

information, though it may temporarily hide some information. For example, if you filter so that only overallocated resources are displayed, Microsoft Project hides all other resources from view. But these hidden resources are not deleted from the Microsoft Project database, and you can redisplay them at any time.

Using filters

You can filter a view using any of these methods:

- Use AutoFilters to filter information in a sheet view.
- Select a commonly used filter from the menu.
- Create and apply your own custom filter.



As in Microsoft Excel, when you have AutoFilters turned on, each column heading in your sheet contains a list of filter values. When you click the arrow in a column heading, you see the list of values available for the column. For example, the list for the Duration column might include the values <= 1 day, > 1 day, and <= 1 week.

You can select values from the list to create a filter. For example, to display only tasks starting and finishing next week, click **Next Week** in the AutoFilter list in both the **Start** and **Finish** columns. Microsoft Project hides any tasks that don't meet your criteria and colors the two column headings blue to indicate that an AutoFilter is applied.

Microsoft Project provides predefined filters that you can apply to a view. Each

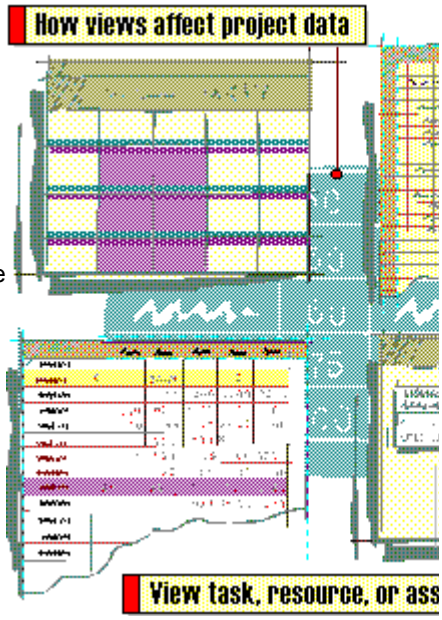
predefined filter focuses on a specific set of tasks or resources and is useful for performing a certain type of project work. For example, the Critical Tasks filter displays only critical path tasks. A unique set of predefined filters is available for the task views and for the resource views.

If you frequently filter on the same criteria, you can create your own custom filter and save it for later use. You create a custom filter by defining the criteria to use when the filter is applied. For example, you might create a filter to show only the tasks assigned to Joe Smith.

What are views?

Microsoft Project can store an immense amount of information—more than you could effectively see at one time. So, Microsoft Project uses views to present subsets of your project information in formats that make it easy to interpret.

Whenever you work with Microsoft Project, you use a view. In most views, you can see, enter, and edit information. By default, and most often, you'll use the Gantt Chart view, which presents the most important information about tasks in a sheet that's easy to edit and as a bar chart that's easy to scan.



The format of each view is tailored to the type of information it presents:

- Information about tasks.
- Information about resources.
- Information about assignments (the work resources are doing on tasks).

To decide which view to use, consider which of the above kinds of information you're interested in. Then, look for the view that presents that information in the format that best suits your purposes. For example, if you want to see detailed

assignment information in a sheet, you might use the Task Usage view, which shows how many hours each resource is working on each task.

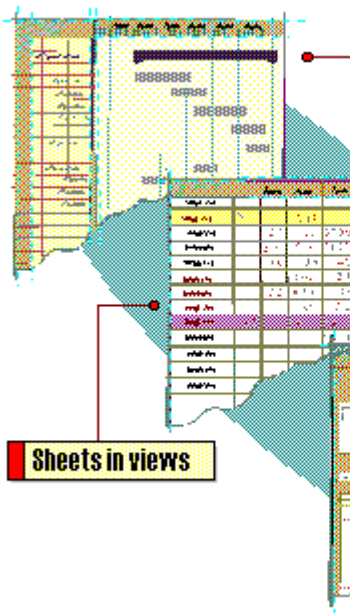
You can switch between views to see different kinds of information, but it's important to remember that views are simply a window into the bigger world of the project database. When you switch views, you see a different set of project information. But the information from the previous view is still stored in the Microsoft Project database and is still updated, even though you can't see it. Likewise, when you change information —for example, a task name—in one view, the change is made in the underlying database. If you then switch to a different view, you'll see the updated task name.

What are views?

To present information effectively, views use a combination of the following formats:

- Charts that graphically represent tasks, resources, or other information.
- Sheets that list information in a table of columns and rows.
- Forms that give details about a task or resource in a format similar to a paper form.

Each view may use any combination of these formats.



Views often present information in charts, which can take different forms. For example, the Gantt Chart view shows tasks as bars, the Resource Graph view indicates the allocation of resources using bars, and the PERT Chart view displays boxes to represent tasks.

Views often include a sheet. Each row in

the sheet displays a task or resource name, and each column displays a different piece of information about the task or resource.

If you're used to using sheets in Microsoft Excel, you'll find the sheets in Microsoft Project familiar, but they operate a bit differently. For instance, you don't enter formulas in Microsoft Project sheets. Also, while cells in Microsoft Excel sheets can hold any kind of information, cells in Microsoft Project sheets are designed to hold specific types of information. For example, one cell may contain the task's name while another cell contains its duration.

Some views include a form that looks similar to a paper form. Forms display details about the task or resource currently selected in another portion of the view. For example, if a task view consists of a sheet and a form, the form displays details about the task currently selected in the sheet. The details might include the name and duration of the task and the name of each resource assigned to it.

What are views?

Views display information that Microsoft Project has calculated for you, as well as information you enter. For example, Microsoft Project automatically fills in the Start field for each task.

Microsoft Project updates the information it calculates as you change related project information. For example, by default, when you add resources to a task, Microsoft Project recalculates the task's duration.

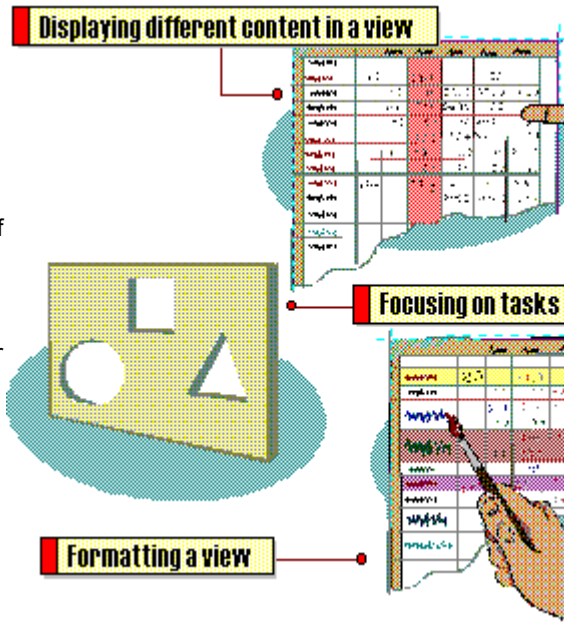
In some cases, you can't edit the information calculated by Microsoft Project. In other cases, Microsoft Project calculates the information by default, but you can override the calculations and enter your own values.

What are views?

You may want to modify a view to present precisely the information you need or to present it in exactly the format you want. You can tailor views to meet your needs by:

- Changing the type of information the view presents.
- Focusing the view on a specific set of tasks or resources.
- Changing the way information is presented.

Customizing a view doesn't change your project information. For example, if you focus on the tasks due this week, Microsoft Project temporarily hides some tasks, but does not delete any of them.



In sheets, tables define the columns that are displayed. Microsoft Project applies a default table to each sheet, but you can change the table. For example, the default table for the Gantt Chart view displays basic columns of information about tasks, such as their name, duration, and start and finish dates. By applying the Cost table instead, you can see columns of cost information, such as fixed costs and total costs.

In forms, you can change the type of information that is displayed by selecting a different set of details for the form.

In most views, you can focus on specific tasks or resources by using a filter. Filters define criteria that tasks or resources must meet in order to be displayed. For example, you might set a filter that shows only tasks that are starting next week.

In sheets, filters determine the rows that are displayed. In charts, filters determine the bars that appear in the chart.

You can format views in many ways. For example, you can change the color of bars in charts, emphasize information by using bold text, and print views with page numbers and titles.

What is a baseline?

Making a view look the way you want

Changing the columns in sheets

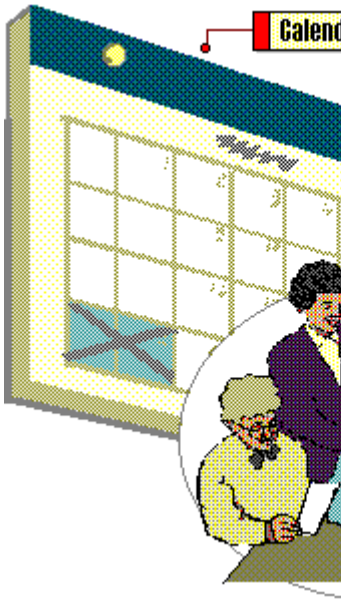
Using filters

What are views?

Setting working hours and days off

Holidays, vacation days, and shifts —how do you tell Microsoft Project when resources are available to work?

You use Microsoft Project's calendars to select and set days as nonworking or working time. For example, by default, weekends are marked as nonworking time in the calendars. You also use the calendars to indicate the specific hours during each day that work is being done.



Microsoft Project schedules resources using their calendar information. For example, if the resource’s calendar shows weekends as nonworking time, Microsoft Project won't schedule the resource to work on tasks during the weekends. If you indicate that a resource works 8 hours a day, Microsoft Project flags the resource as overallocated whenever its work exceeds 8 hours in a day.

Setting working hours and days off

Microsoft Project provides three types of calendars:

- The *project* calendar defines the working times for the entire project.
- *Resource* calendars define working and nonworking times (such as vacations) for specific resources.
- *Base* calendars define working and nonworking times for groups of resources.

Microsoft Project provides the Standard calendar which, by default, is your project calendar. You can, however, choose another project calendar from your base calendars.

By default, the project calendar's settings affect every resource calendar in your project. Even if you have tasks without any assigned resources, Microsoft Projects schedules the tasks using the project calendar . By modifying this calendar's settings, you can make the project calendar reflect the working and nonworking times of the resources on your project. For example, set holidays or all-day company meetings as nonworking time. If your people usually work a 9:00 A.M. to 5:00 P.M. schedule, set their hours accordingly.

Microsoft Project automatically creates resource calendars for every resource. Use base and resource calendars to note exceptions to the project calendar. For example, note sick time as nonworking time in a resource's calendar. If your painters work only 4 hours a day, set their working hours in a Painters' base calendar.

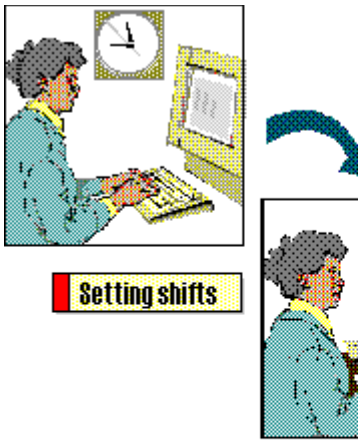
By default, Microsoft Project creates resource calendars based on the Standard calendar. You can, however, base a resource's calendar on a calendar other than Standard.

When you change days in a base calendar to nonworking time or change the working times for a day, every resource calendar based on the calendar you changed is also updated. For example, if Joe's and Jim's calendars are based on the Contractors' calendar and you set October 12 to be a nonworking day in the Contractors' calendar, October 12 also becomes a nonworking day in Joe's and Jim's individual resource calendars.

Setting working hours and days off

You can set entire days in a calendar to nonworking time or set working times for specific days, entire weeks (or months), or specific days of the week.

If a resource doesn't work a specific shift, just set working hours that reflect the total number of hours the resource works in a day. For example, you can indicate that a resource works 8 hours a day by setting the working times from 8:00 A.M. to 4:00 P.M. for each working day.



To set working times in a calendar, select the days you want to adjust, and then indicate the time periods during which the resource works on those days. For example, you might enter:

From 9:00 A.M. to 12:00 P.M.
From 1:00 P.M. to 5:00 P.M.

The unworked period from 12:00 P.M. to 1:00 P.M. indicates a break. If you wanted to indicate an afternoon break as well, you could enter the working times as:

From 9:00 A.M. to 12:00 P.M.
From 1:00 P.M. to 2:30 P.M.
From 2:45 P.M. to 5:00 P.M.

To create night shifts, you enter the working times for each of the 2 days that the shift covers. For example, if a resource works from 10:00 P.M. Tuesday

to 6:00 A.M. Wednesday, you would enter shifts for each day:

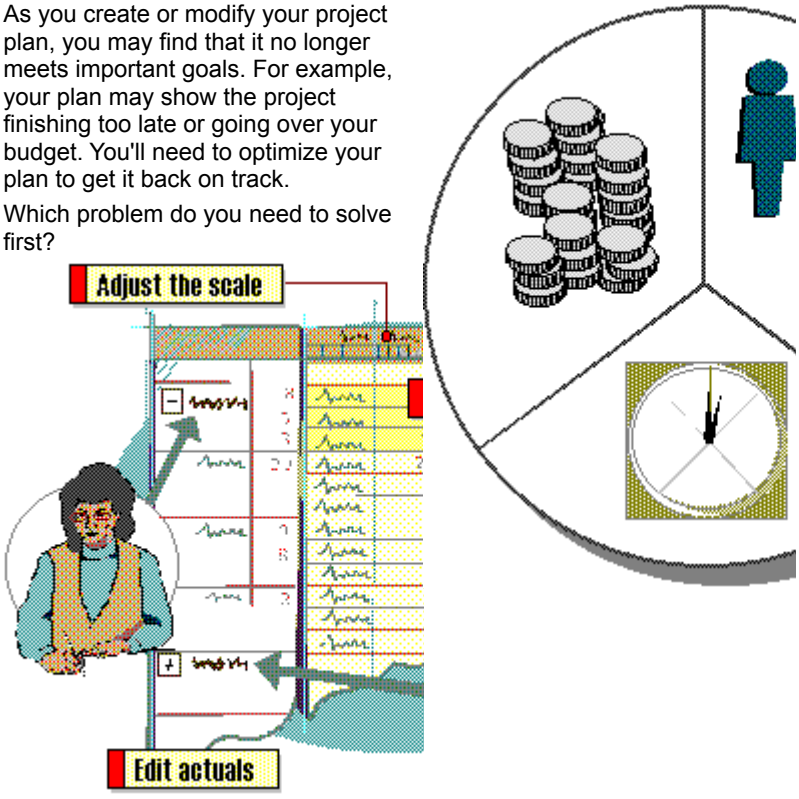
Tuesday:
From 10:00 P.M. to 12:00 A.M.

Wednesday:
From 12:00 A.M. to 6:00 A.M.

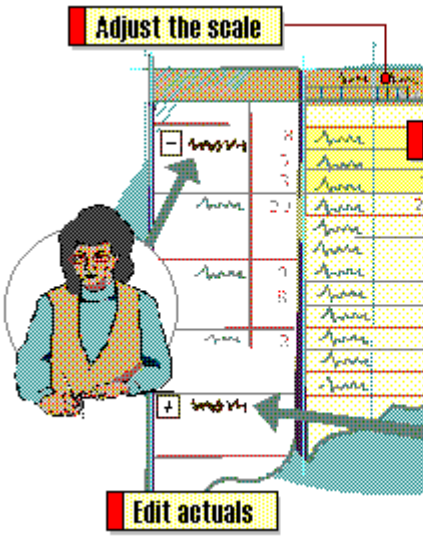
Optimizing my plan

As you create or modify your project plan, you may find that it no longer meets important goals. For example, your plan may show the project finishing too late or going over your budget. You'll need to optimize your plan to get it back on track.

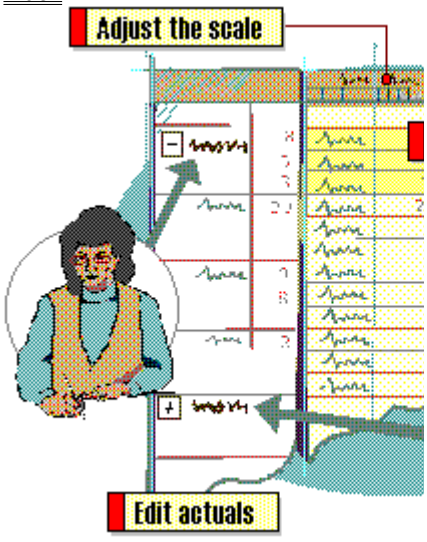
Which problem do you need to solve first?



My project's taking too long



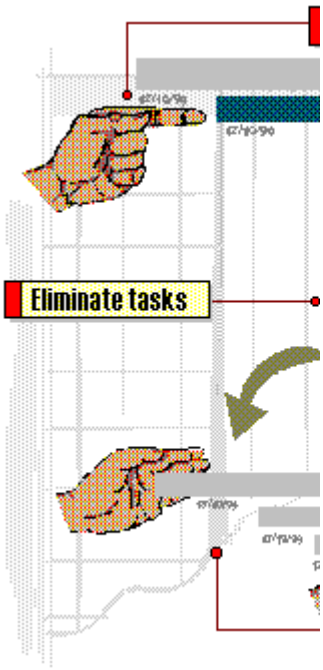
My project or tasks are costing too much



My resources aren’t being used efficiently

Optimizing my plan

If your project is taking too long, the first step is to identify the tasks that are delaying it, called *critical path tasks*. Once you've identified the critical path tasks you can adjust them in order to shorten the schedule. You have several choices for shortening the schedule including eliminating some of the critical path tasks or completing some of them early. Choose the method that best meets your needs.



For the purpose of optimizing, a critical path task is either a task that finishes on the project's finish date or is one of a series of linked tasks in which the last task finishes on the project's finish date. To identify the critical path tasks for your project, use the GanttChartWizard to format the Gantt Chart and highlight the critical path for your project. The highlighted tasks are the ones that determine your project's finish date.

Carefully evaluate critical path tasks to determine whether all of them are really necessary to the successful completion of your project. If you do eliminate a task, consider the impact on other tasks now or in the future. You may need to adjust the plan to compensate for the deleted task, or you may find that deleting the task also makes other tasks unnecessary.

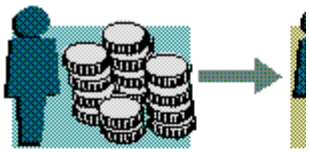
You can finish tasks early by:

- Reducing the scope of the task so that it doesn't take as long to do.
- Adding resources to the task or having them work more hours (or overtime).
- Starting the task early.

Also, check constraints and dependencies to be sure they're necessary. And remember that you can fine-tune dependencies with lead and lag

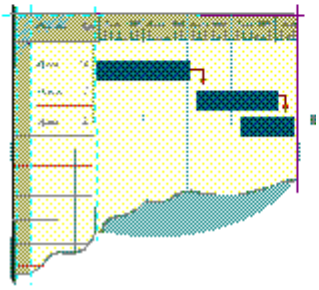
time. For example, instead of hanging the clocks after you finish painting, start hanging them half-way through the painting, when some walls have already been finished.

Optimizing my plan



The first step in reducing costs is to determine where you're spending the most money. Use the Gantt Chart view with the Cost table applied to see the costs for tasks and the Resource Sheet view with the Cost table applied to see the costs for resources.

Next, consider ways to reduce the highest costs. Most of the time, resources represent your biggest cost. Generally, you can reduce costs by either eliminating tasks from the project, reducing the scope of tasks so that they cost less to complete, or using fewer and cheaper resources.



Carefully evaluate costly tasks to decide whether they're necessary to the successful completion of your project. If you do eliminate a task, consider the impact on other tasks. You may need to adjust the plan to compensate for the deleted task, or you may find that deleting the task also makes other tasks unnecessary.

If a costly task is necessary to the project, consider whether you can reduce its scope so that it doesn't cost as much. For example, instead of exhibiting clocks in four galleries, exhibit them in only two, thereby reducing the time it takes to paint the walls.

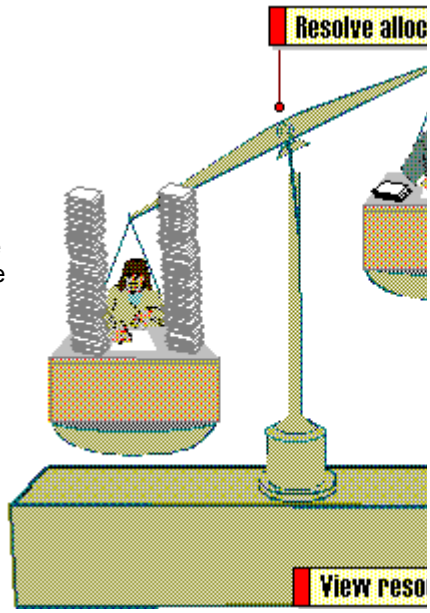
You may be able to save money by taking resources off tasks or substituting cheaper resources. You might have a cheaper resource do the entire task or have the cheaper resource do more of the work than the expensive resource. Keep in mind that there are tradeoffs

when substituting resources. A cheaper resource may not be able to complete the task as quickly or as well as a more expensive resource.

Optimizing my plan

You may want to optimize your plan so that each resource is working at exactly full capacity. For example, you may want to optimize resource usage because you have limited resources. Or, you may want to reduce costs by ensuring that your resources aren't working overtime.

The first step in optimizing resource usage is to see which resources are overallocated and which are underallocated. Let Microsoft Project resolve overallocations or adjust the plan yourself.



Use the Resource Usage view to see how resources are allocated. For each resource, this view shows the total hours the resource is working and the hours the resource is working on each task. The Resource Usage view highlights overallocated resources and displays an indicator for them.

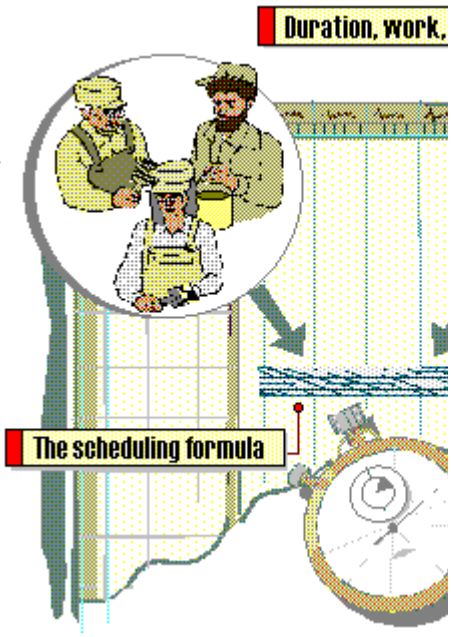
You can resolve underallocations by assigning more tasks to the resources. You can resolve overallocations yourself or let Microsoft Project do it. You resolve an overallocation by:

- Removing the resource from some tasks.
- Reducing the number of hours the resource works.
- Reducing the amount the resource works on specific tasks.
- Spreading the task, and therefore the resource's work, over a longer period of time.

Changing the way Microsoft Project schedules

Microsoft Project considers many factors when setting a task's start and finish dates (such as constraints you've set on the dates, dependencies on other tasks, and the task's duration). Task duration is crucial. Your project's finish date is determined by the latest finish dates of its tasks. Those finish dates are affected by how long the tasks take to complete.

The duration of each task is determined by resource availability and, most importantly, by the formula *duration = work/resources*. If you assign resources, Microsoft Project uses this formula as the basis for all its scheduling.



What are work, duration, and resources?

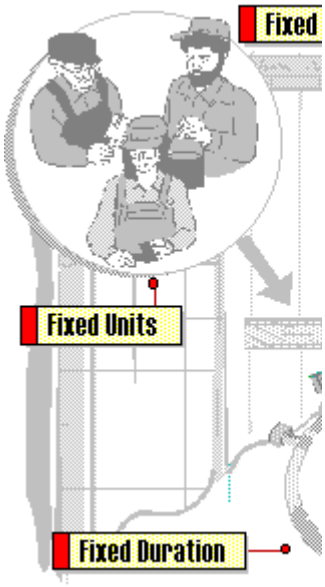
- *Duration* is the actual amount of time that passes before the task is done.
- *Work* is the amount of effort resources put into the task. For example, if two painters work two 8-hour days on a task, the task's total work is 32 hours. Work acts as a kind of person-hour estimate.
- *Resources*, for scheduling purposes, are the people or equipment assigned to the task and the amount they're allocated to it, whether they're working full-time, part-time, or overtime.

Initially, you estimate a task's duration and assign resources. If you then change resource assignments or work estimates, Microsoft Project calculates a new duration using the formula.

For example, if you assign two painters to work for two 8-hour days on a task, you set the initial work to 32 hours and the initial duration to 2 days. If you change the painters to work half-time on the task, Microsoft Project calculates the new duration by dividing the 32 hours of work you originally estimated by the two half-time resources. The duration becomes 4 days.

Changing the way Microsoft Project schedules

In most cases, you'll want to use Microsoft Project's default settings. However, if necessary, you can choose which piece of the scheduling equation Microsoft Project calculates for a task by setting its task type: fixed duration, fixed units, or fixed work. By default, units are fixed, causing Microsoft Project to calculate duration.



When duration is fixed, it remains at whatever value you enter and Microsoft Project calculates resource units as you change assignments' work. For example, say you assign two painters full-time to paint the walls in 4 days. Later, you assign two more full-time painters. Microsoft Project sets the units for each painter to 50%, because four painters only need to work half-time to complete the walls in 4 days.

If you adjust the task's duration, Microsoft Project calculates work. In our painting example, the total work for the task is 64 hours (4 painters * 4 days * 4 hours per day). If you change the task's duration to 2 days, Microsoft Project recalculates the total work: four painters working half-time over 2 days is 32 hours.

Units determine the allocation of a resource to a task: at 100% units, a person is working full-time; at 50% units, the person is working half-time, and so on.

By default, units are fixed, meaning allocation remains at the unit value you set. As you change resource assignments, Microsoft Project adjusts the duration. For example, say you assign two full-time painters to paint the walls in 4 days. If you then assign two more full-time painters, Microsoft Project reduces the duration to 2 days.

If you adjust the work for individual resources, Microsoft Project recalculates and changes the total duration for the

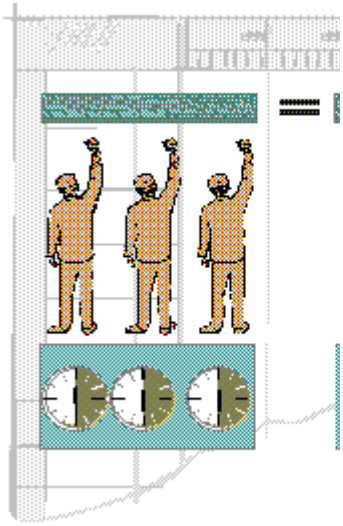
task.

When you set a task to fixed work, Microsoft Project does not calculate the work for the task or resources. Instead, as you change resource assignments, Microsoft Project calculates duration.

For example, if you assigned two painters full-time to paint the walls in 4 days, and you then assign two more full-time painters to the task, Microsoft Project reduces the duration to 2 days. If you adjust the task's duration, Microsoft Project adjusts each resource's units. For example, if you now increase the duration from 2 days to 4 days, Microsoft Project sets each resource's units to 50%, so each resource works only half-time.

Changing the way Microsoft Project schedules

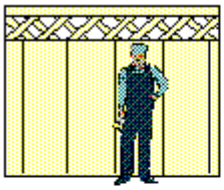
Use task types to make your schedule more accurate and get the information you need. To choose the right task type, determine which information is fixed for the task. For example, if you would put your proposal out for a 5-day review no matter how many people reviewed it, create a fixed-duration task.



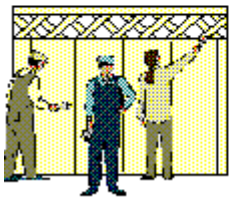
Let Microsoft Project calculate the information you need for the task. For example, say "Paint the walls" is a 5-day, fixed-duration task with three resources assigned, but you need to remove one. When you remove the resource, Microsoft Project recalculates the remaining resources' units, showing you how much extra they have to work to paint the walls in 5 days.

What is work?

Work is the effort required to do a task. There are two types of work: the work of individual resources on a task and the total work for the task. For example, if three painters work two 8-hour days on a task, the work for each resource is 16 hours. The total work for the task is 48 hours.



Work affects duration, because *duration = work/resources*. For example, if you assign three painters to work two 8-hour days, the work is 48 hours (2 days * 8 hours * 3 painters). The duration is 2 days: 48 hours / (3 painters * 8 hours).



Normally, Microsoft Project calculates how much work each resource puts into a task. But you can fine-tune your schedule by setting the amount of work that each resource performs. For example, say that you have an expensive resource and a cheaper resource both working on a 40-hour task. If it's important to keep costs down, you might have the expensive resource work only 12 hours on the task and have the cheaper resource work 28 hours.

The Task Usage view shows each task, the total work for the task, and how much work will be done on it each day. It also shows the total work each resource will do on the task and the work each resource will do each day.

You can edit work in the Task Usage view, but use caution. Editing work may have different effects depending on the type of task you edit.

Setting working hours and days off

Optimizing my plan

Changing the way Microsoft Project schedules

What is work?

Microsoft Project 101: Fundamentals

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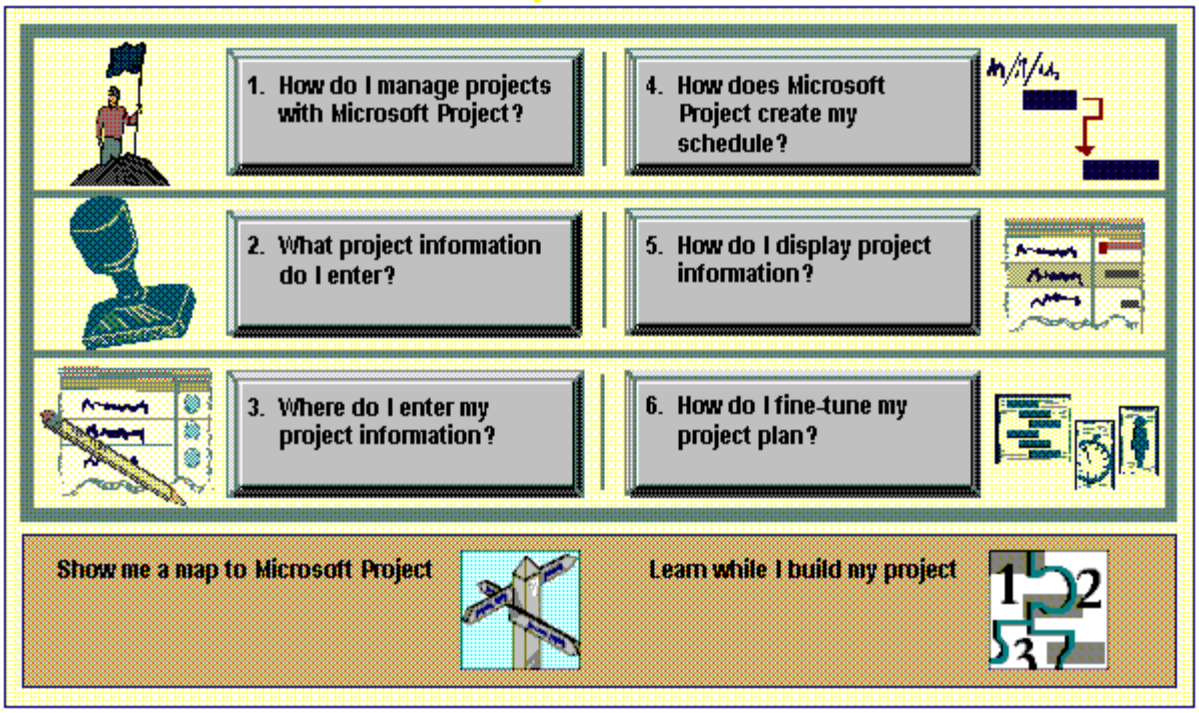

Quick Preview