

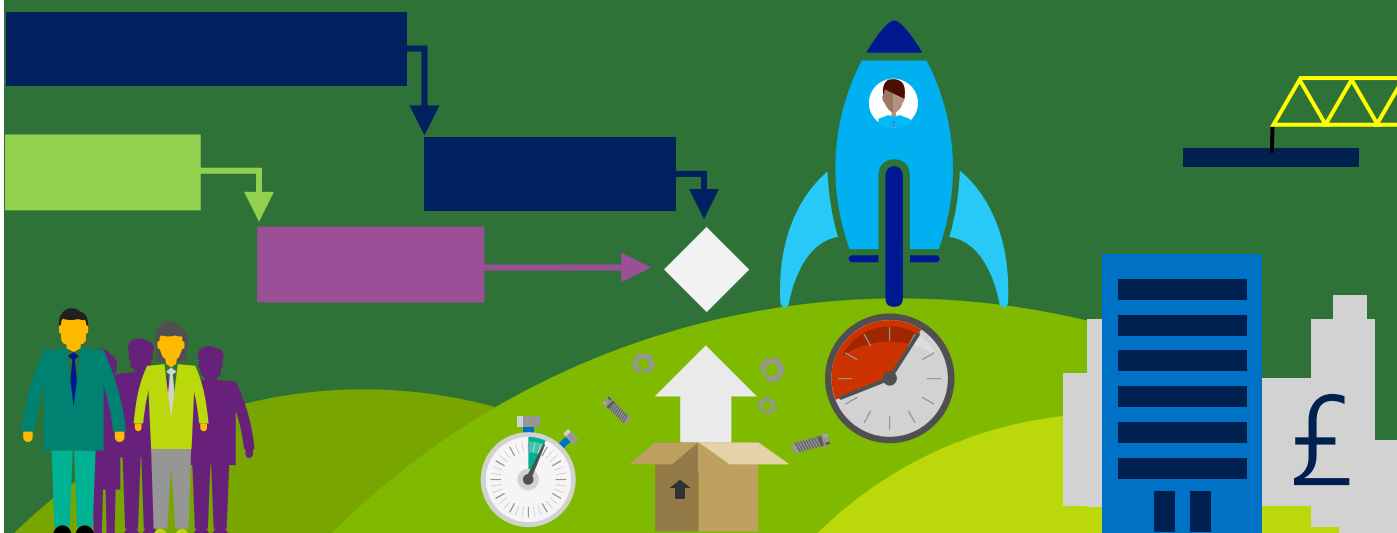


Microsoft Office Training Series

Project



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Module 1: Project Management and Project

Objectives

After completing this module you will be able to:

- Start Project.
- Note the difference between Project Standard and Project Professional editions and the new features available.
- Open a Project File.
- Use the ribbon interface and the new Timeline view.
- Change the View of a Project.
- Understand terms and procedures in project management and planning.

Microsoft Project has many useful features to help you to plan projects, manage and update project information, and communicate the status once the project is under way:

- The Gantt chart can show the project schedule graphically on a time scale, with scaling 'zoomed in' down to units of ¼ hour, or 'zoomed out' up to yearly intervals.
- You can 'outline' your project into phases of summary tasks and sub tasks and collapse the view to print only the top level tasks.
- You can create different working times for each group of resources and for each individual resource if required.
- Filters, sorts and grouping can be applied to view selected information meeting your defined criteria.
- There are views and reports to help you quickly identify resource availability and costs.
- You can attach documents to tasks (for example Visio diagrams, or Excel spreadsheets) so that your project plan is a complete database of your project.
- Saving Baseline plans allows you to track actual progress and view date and cost variances.
- You can create custom fields so you can track additional information unique to your project.

New features and edition comparison













The Microsoft Project family of products consists of Microsoft Project Standard, Microsoft Project Professional and Microsoft Project Server.

The content of this course refers to features available in the two desktop versions (Standard and Professional). Most of the end user features are available in both versions, the main difference being that the Professional version is required if you want to connect to Project Server or sync tasks with SharePoint. The following edition comparison is reproduced with acknowledgements to Microsoft Corporation and details the improved and new features available in Project.









Simplified Navigation










Microsoft Project Standard 2010 Microsoft Project Professional 2010

Increase productivity with the Ribbon, a tab interface to quickly find and use Project features and controls.		
Quickly learn about features with hover-over command Tool Tips, Status bar messages and context-sensitive online Help.		
Personalize the Ribbon by adding or removing actions on the tabs and creating personal galleries.		
Enter and find project information with Excel-like ease using auto complete, text wrap, flexible data types and check-box column filters.		
Use Ribbon formatting commands to easily customize the look and feel of Gantt charts and tasks to help capture your audience's attention.		
Quickly access tools, templates and program options for Project using the new Microsoft® Office Backstage™ view.		







Timeline View

Selectively place phases, milestones and key tasks in the new Timeline view to provide a high-level summary of your project schedule.		
Illustrate key milestones or phases with new visual effects and colors. Zoom and pan to show different dates and scenarios.		
Copy and edit the Timeline graphic in Office applications (such as Word, PowerPoint, Outlook) to communicate project status quickly.		









User-Controlled Scheduling

Combines the power of Project's scheduling engine with the flexibility to choose between manually scheduling tasks with explicit dates and durations or calculated dates.		
Quickly plan projects top-down with manually scheduled summary tasks.		
Create tasks using current information such as "TBD" and enter known dates and duration later when details are known.		
Compare manually entered project phase duration and start/finish estimates with bottom-up schedule details.		
Perform what-if analysis and review impacts on schedule and resources using active/inactive tasks.		

At-A-Glance Resource Management

Visually drag and drop resources in an interactive resource view to simplify complex resource scenarios.	
Quickly spot unassigned or unscheduled work as well as overload conditions. Drag and drop assignment changes to relieve overload.	
Be alerted to potential scheduling concerns with visual cues and use Task Inspector warning and suggestion dialog boxes to resolve conflicts.	 
Take corrective action such as leveling over-allocated resources on task-by-task basis.	 

Collaboration

Collaborate on schedule development by copying and pasting schedule details using Office applications (i.e., Outlook, Word, Excel, etc.) with outline levels and formatting maintained.	 
Collaborate with others on your project schedule by saving it to a SharePoint site.*	 
Publish your project schedule to a SharePoint task list, receive task updates from your resources and the two are automatically synchronized.*	
With Project Server 2010, gain control across all types of work, improve project selection and strategic alignment, maximize resource utilization and visualize performance through powerful dashboards.**	
Offering 64-bit compatibility provides customers with performance improvements, especially attractive for customers that create very large and complex master projects.	 

* - Microsoft SharePoint® Foundation 2010

** - Project Professional 2010 connected to Microsoft Project Server 2010

Microsoft Project has numerous new features which are explored during this course:

- Customizable fluent user interface (the new ribbon) and Quick Access Toolbar
- Timeline view
- Team Planner (Professional version only)
- Manual v Auto scheduling
- Task Inspector
- Active/inactive tasks
- Top down summary tasks

Starting MS Office Project

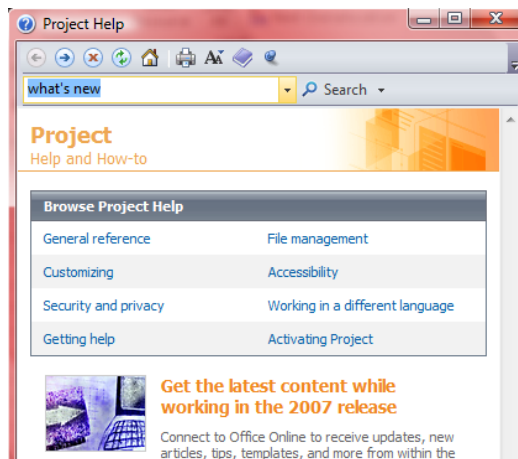


1. Double-click on the **MS Office Project** icon on your desktop.
Or
2. Click the Start button; select All Programs; select the Microsoft Office Project icon (this may be in the Microsoft Office folder).

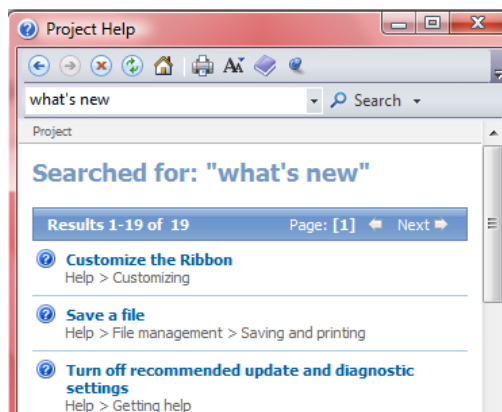
Using Help

Note: The Project Guide is no longer available in Project

1. Click on **Help** or press **[F1]** to display the Help dialog box:



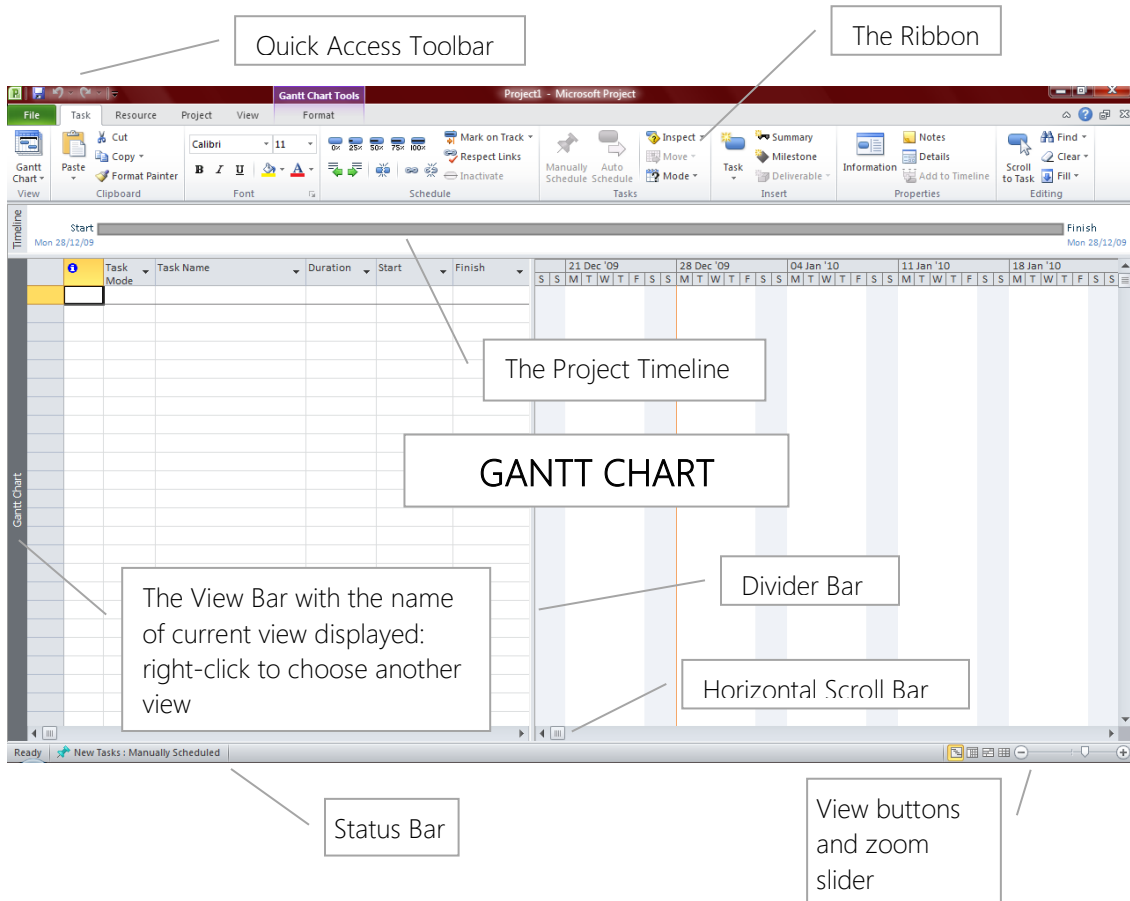
2. Type a word or phrase and click **Search** to find help on that specific topic:



3. Click on any of the blue hyperlinks to display the various help topics
4. **Exit** the Help system by clicking the red **Close** button

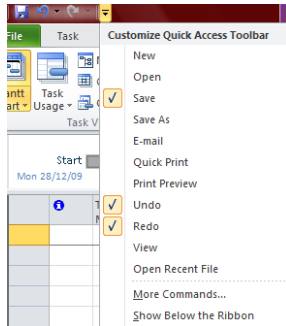
MS Project- The Screen

The default Project view is the *Gantt Chart* view which consists of a table of data on the left hand side of the screen and a Gantt bar chart on the right. The Divider Bar separates the two and can be repositioned to display more of the table or more of the chart. The Gantt table consists of rows and columns. Just like on a spreadsheet, the intersection of a row and a column is called *acell*. The Gantt bar chart graphically displays your schedule.

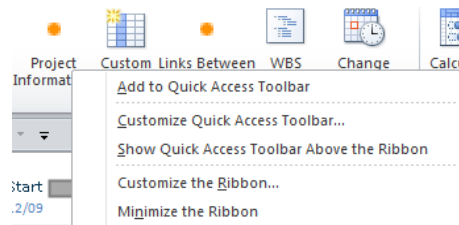


The Quick Access Toolbar:

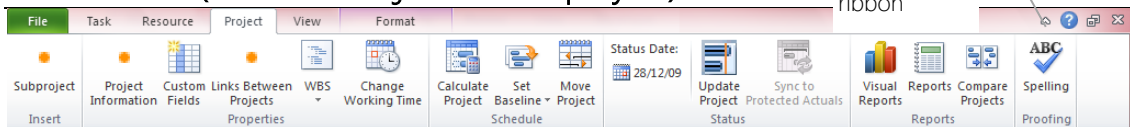
The Quick Access Toolbar (QAT) is a customizable toolbar that can display either above or below the Ribbon. Click the **Customize Quick Access Toolbar** (on the right of the QAT) to change how it is displayed:



Tip: to add commands (buttons) to the Quick Access Toolbar, right click any existing command and from the shortcut menu choose Add to Quick Access Toolbar:



The Ribbon (with the Project tab displayed):



The Ribbon, which is part of the Microsoft Office Fluent user interface, is designed to help you quickly find the commands that you need. Commands are organized in logical groups that are collected together under tabs.

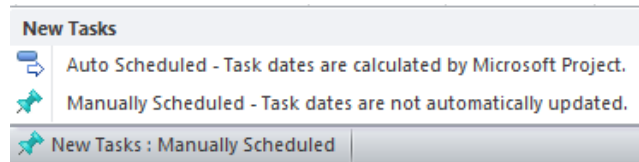
Note: The Format tab is context specific – the commands on it changes depending on the view/area of the screen that is selected.

When the Ribbon is minimized, you see only the tabs. To use the Ribbon while it is minimized, click the tab you want to use, and then click the option or command you want to use.

Tip: To quickly minimize the Ribbon, double-click the name of the active tab. Double-click a tab again to restore the Ribbon. The **Keyboard shortcut** to minimize or restore the Ribbon is CTRL+F1.

The Status Bar:

The status bar displays information such as whether filters are applied or whether new tasks are Manually or Auto Scheduled:

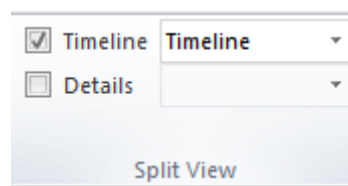


On the right of the status bar is the Zoom Slider and quick buttons for displaying the main views of Project (Gantt Chart, Task Usage, Team Planner and Resource Sheet):



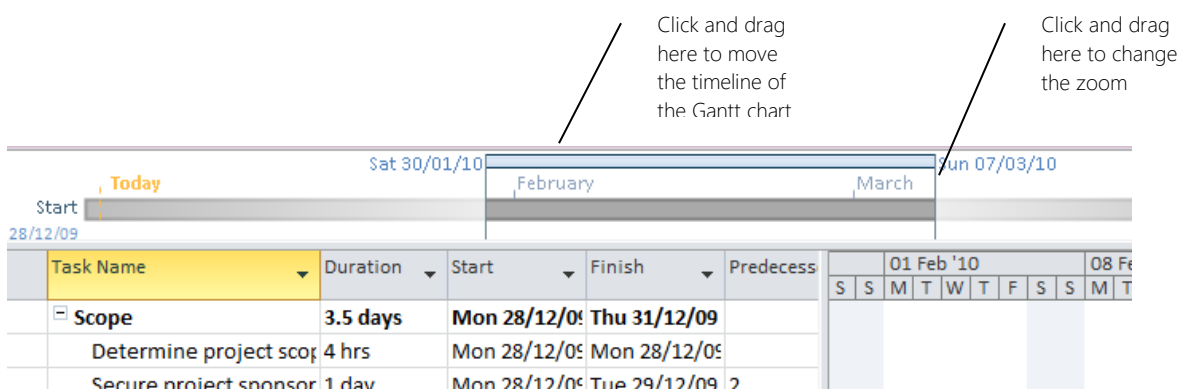
The Project Timeline:

On the View tab there is an option to show or hide the Project Timeline

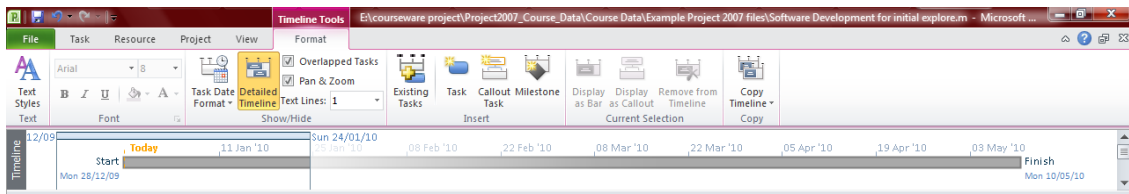


The Timeline is a new feature in Project which allows you to easily create a high level view of your project plan that you can then share through other Office applications such as PowerPoint and Outlook.

You can use the Timeline to zoom or change the time displayed for your project:

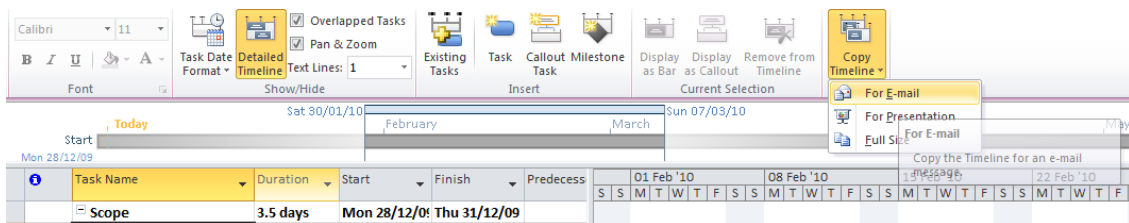


Click on the Timeline to select it and then click the Format tab so see specific options:

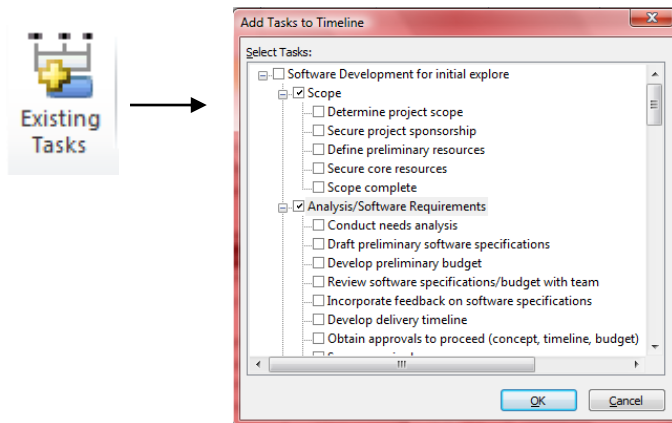


Note: When the Timeline is active, many of the commands on the Task and Resource tabs of the ribbon will be greyed out. Click back on the Gantt chart/Gantt table to work as normal.

Click the Copy Timeline command to be able to paste a picture of your project into an email or other document:

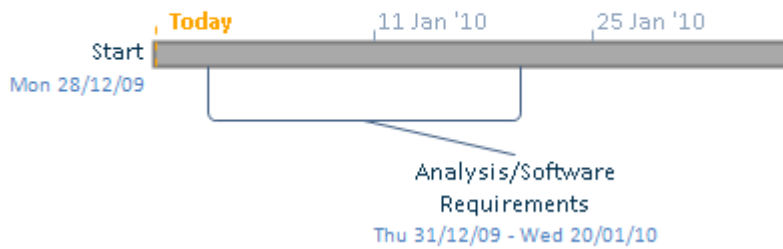


Click the Existing Tasks command to display specific tasks on the timeline:

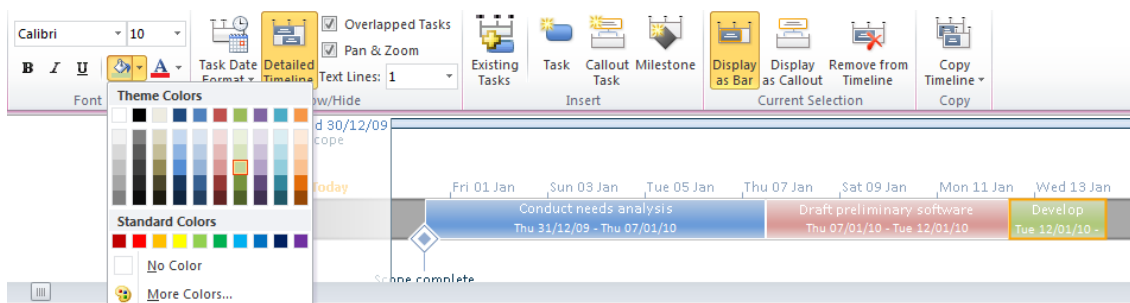


Tip: You can also drag and drop tasks onto the Timeline.

Right click the Timeline to change how tasks are displayed: tasks can be displayed on the timeline as a bar, or as callouts:

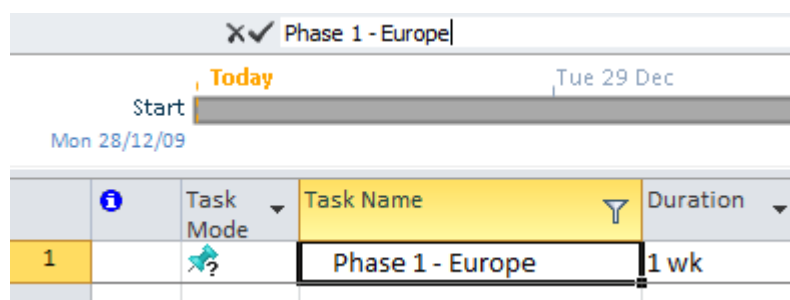


You can also apply formatting to the Timeline by clicking the relevant task and using the font commands:



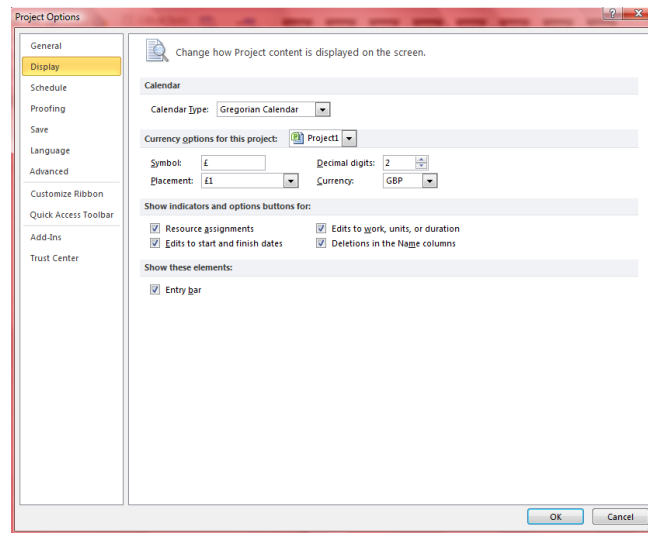
The Entry Bar:

The Entry Bar allows you to edit the content of a cell:



Note: Unlike previous versions of Project, the Entry Bar is not displayed by default. To display the Entry Bar:

1. Click the File Tab
2. Click Options
3. Click Display
4. Click the option to show the element Entry Bar:

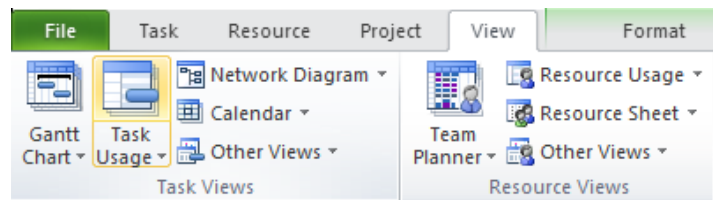


Introduction to Project Views

MS Project is a large database holding all the information relating to both tasks and resources. This information is organised into **Views** or preset formats classified as:

- **Task views** which display mostly task-related information (for example Gantt Chart, Task Usage and Network Diagram views)
- **Resource views** which display mostly resource-related information (for example Team Planner, Resource Usage and Resource Sheet views).

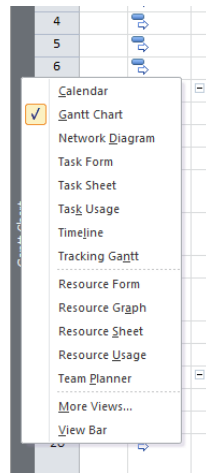
Use the View tab to access the main Project views:



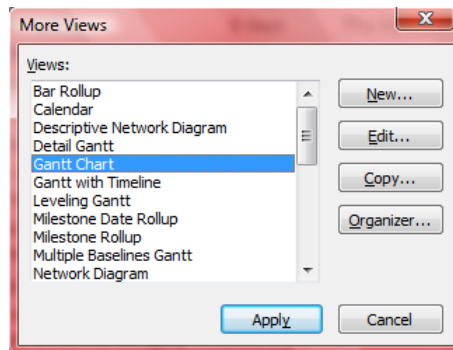
You can also use the view buttons on the Status Bar:



Or right click the View Bar:

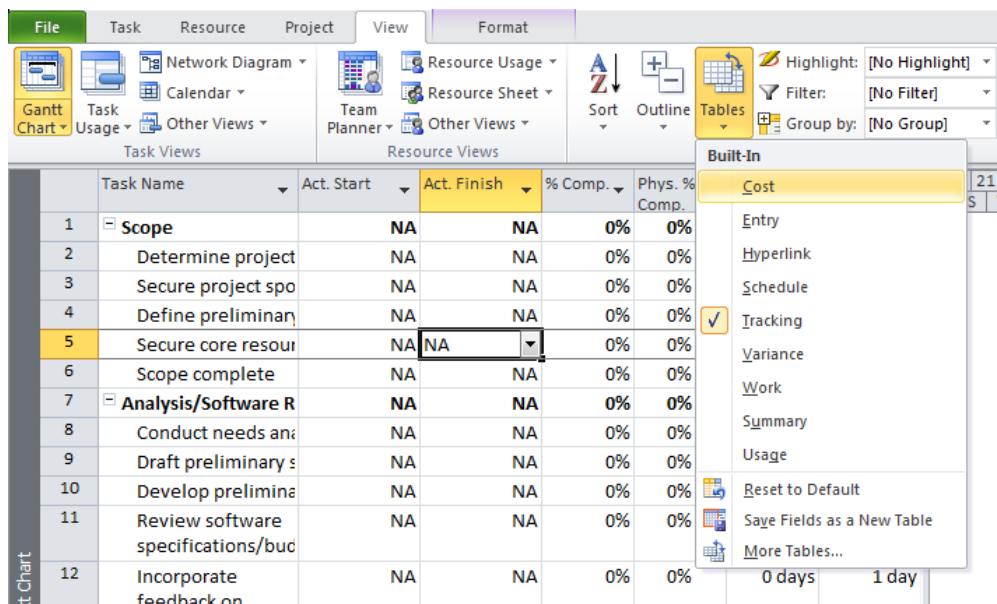


As well as the standard views, you can select More Views to see more detailed and complex views:



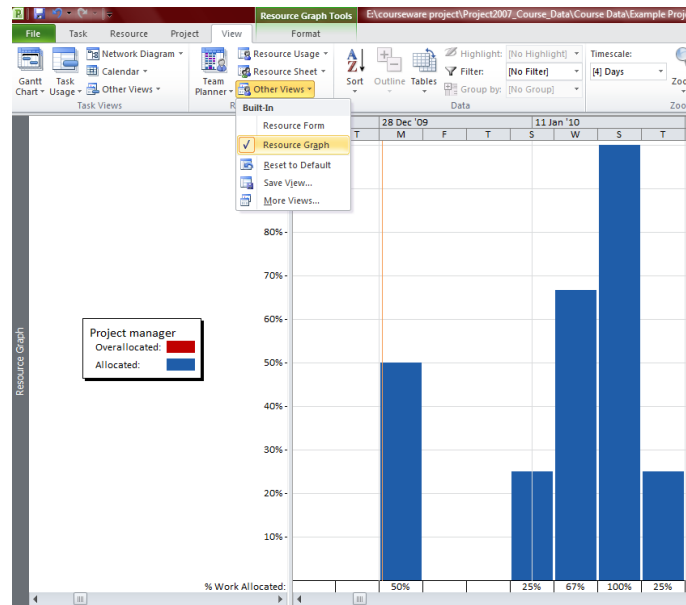
The views are further classified as sheet, graph or form format:

Sheet format displays information about many tasks or resources in columns and rows. Project has predefined sets of columns (called tables) which display specific information. To apply a different table to a sheet view, click the View tab, click Tables, and then select the table you want to apply:



It is possible to add/remove columns from the view – this is covered in the intermediate course.

Graph format displays information graphically (e.g. Resource Graph view)



Tip: You can right click the graph to choose to display other details, such as cost. **Form Format** displays fields of information for a single task or resource arranged on screen in a format similar to a dialog box (e.g. Task Form view):

ID	Resource Name	Units	Work	Ovt. Work	Baseline Work	Act. Work	Re
2	Project manager	100%	4h	0h	0h	0h	4h
3	Analyst	100%	4h	0h	0h	0h	4h

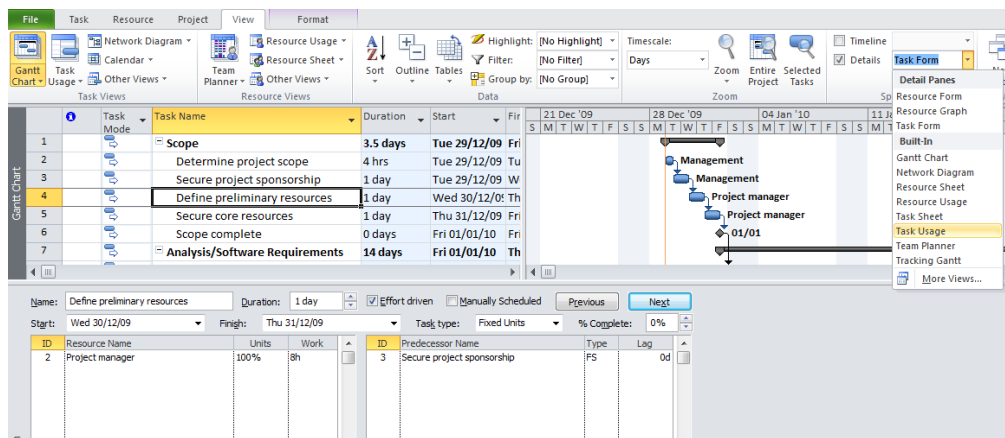
Tip: You can modify a form to display different information. For example, you can display the cost of a selected resource instead of the resource schedule on the Resource Form. To display different details, right-click the form.

Combination views

Views can be displayed separately or in any combination of two - for example, the Task Entry view is a preset combination view with the Gantt chart in the top half of the screen and the Task form in the bottom half.

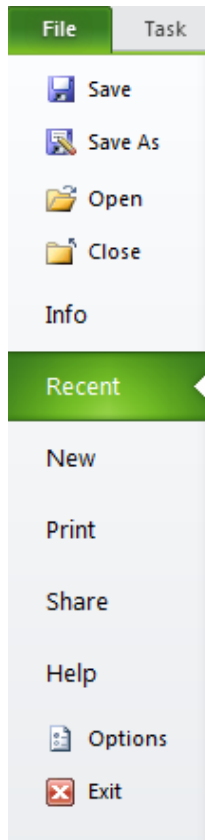
You can manually combine most single-pane views on the screen to create a split screen view. When two views are combined, the information in the bottom relates only to the task or resources in the top view. The reason for having combination views is to make the job of entering and analysing information easier. To display a combination view:

1. On the **View** Tab in the Split section, click **Details**
2. Choose the required detail from the drop down list



Note: To remove the split, uncheck the **Details** option.

MS Project – using the Ribbon





The File Tab

After you click the **File** tab, you can see the new **Microsoft Office Backstage view** which is common across all of the MS Office suite of applications. The Backstage view is where you manage your files and the data about them — creating, saving, inspecting for hidden metadata or personal information, and setting options. Further information about this options will be provided later in the course.


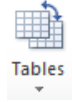

Note: To continue working on your project, you need to click back on the Task tab of the ribbon.

The Task Tab	The Task tab is similar to the Standard and Formatting toolbars available in previous versions and has commands to link, outline and track tasks.
The Resource Tab	The Resource tab pulls together the various tools for allocating, sharing and levelling resources.
The Project Tab	The Project tab is a combination of both the Project and Tools menus available in previous versions and includes commands to change the Project calendar and baseline the project.
The View Tab	The View tab has features from View, Project and Windows menus available in previous versions and includes commands to change the Project calendar, baseline the project and sort and filter.
The Format Tab	The Format tab includes options to customise the look of the Gantt chart (like the Gantt Chart wizard in the previous versions)

Exercise: Opening and viewing a project

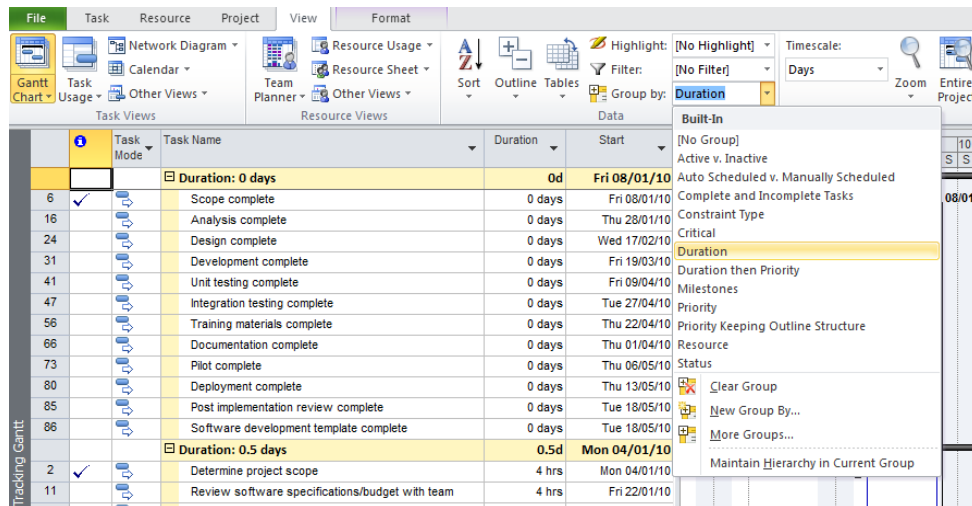
- 1 Click the **File** tab and click **Open** to open a project file.
- 2 Select **Software Development with Baseline_Tracking.mpp** from the **Project Data Files** folder
- 3 Use the scroll bars to look at the project.
- 4 On the **Task** tab click the **Find** command  **Find** and search for *training* – you will be moved to row number 48.
Note that you can't see the Gantt bar for this task.
Click the **Scroll to Task** command to view the Gantt bar. 
- 5 Press **[Ctrl-Home]** to go to row 1 of the project and **[Alt-Home]** to view the start of the project on the Gantt Chart.
- 6 Alter the time scale with the **Zoom Slider** on the Status Bar.

Change the View

- 1 Click on the **View** tab.
- 2 Click the **Details** box and note that the Timeline is hidden and the Task Form appears in the bottom of the screen.
- 3 Click the drop down arrow of the Details view list and select **Task Usage** – note that as you select different tasks in the top half of the screen, the resource information for that task is displayed in the bottom half of the screen.
- 4 Remove the split screen by un-checking the Details box.
- 5 Choose each of the main views (Task Usage, Network Diagram, Calendar, Team Planner, Resource Usage, Resource Sheet) and note the different screens.
- 6 Select **Gantt Chart** to return to the original view. 
- 7 Move the mouse to the central vertical bar on the screen when it will change to a double line with a double-headed arrow
- 8 Click and hold the left button and drag left to see more of the Gantt Chart.
- 9 Repeat but drag right to see more of the Entry Table.
- 10 On the **View** tab, click the **Tables** command and choose **Summary**. Note that different columns are displayed. Click the **Tables** command and choose **Entry** to return to the normal view. 
- 11 On the **Format** tab click the **Project Summary Task** command and note that a new Gantt bar appears at row  **Project Summary Task**

Test the 'Group By' Feature

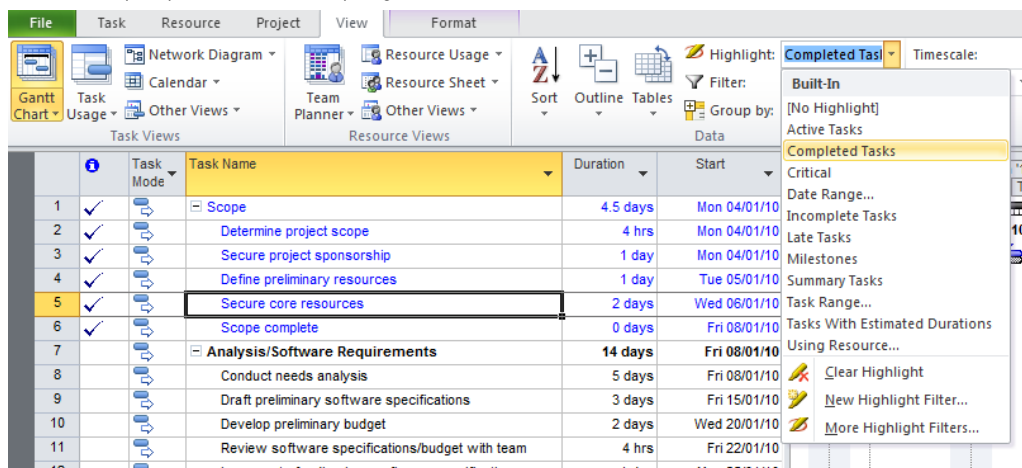
- 1 With the Project open (in the default Gantt view), click View tab and click the drop down arrow to the right of the Group By drop box.
- 2 Select **Duration** as the new grouping view.



- 3 View the diagram in this different (grouped) format then change the view back to [No Group].

Test the 'Highlight Feature

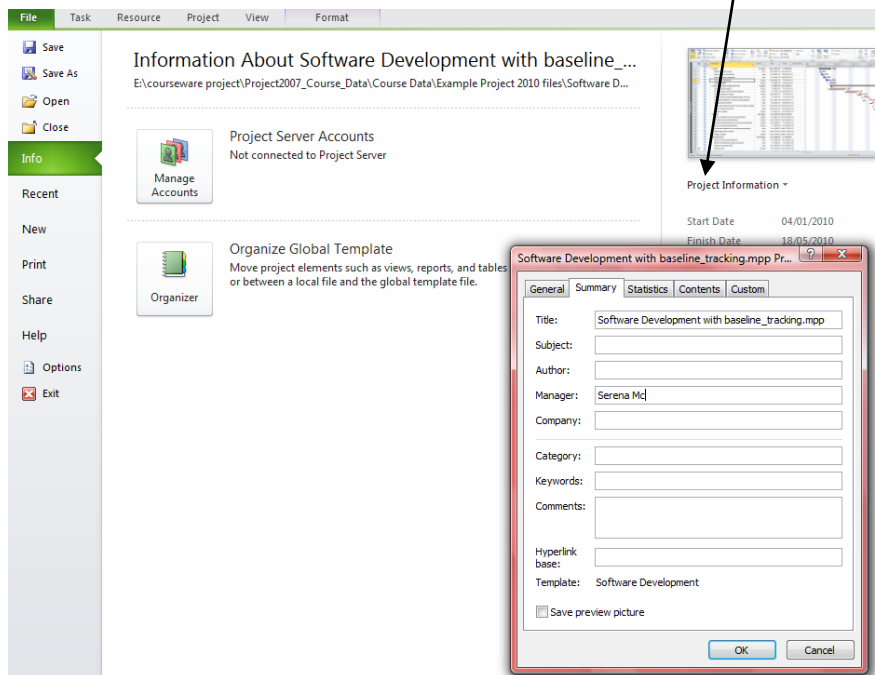
- 1 With the Project open (in the default Gantt view), click the View tab and click the drop down arrow to the right of the Highlight box.
- 2 Choose Completed Tasks and note that the text of all the tasks in the Scope phase of the project is coloured blue:



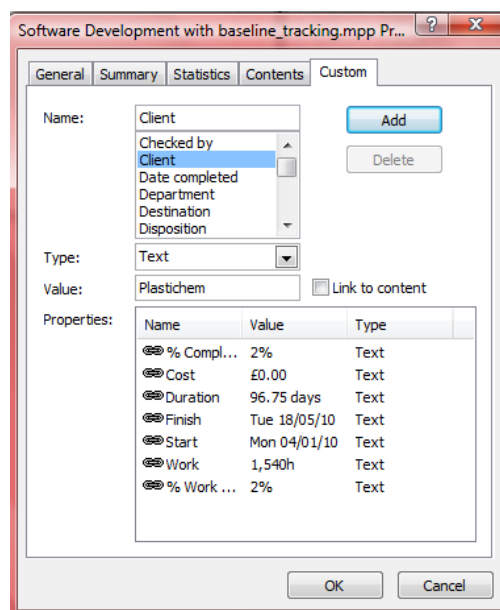
- 3 Change the view back to [No Highlight].

View and change the Project Information

- 1 Select the **File** tab and from **Info**, click **Project Information/Advanced Properties**:

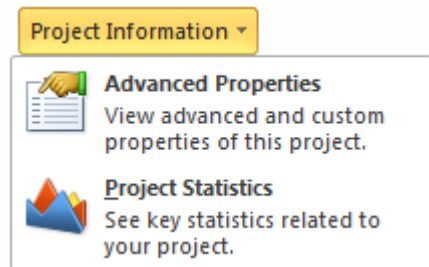


- 2 On the **Summary** tab of the properties dialog box, type in your name as the project manager.
- 3 Select the **Custom** tab.
- 4 Select **Client** and in the **Value** box type 'PlastiChem':



- 5 Click **Add** and click **OK**

- 6 To see project progress so far, select Project Information/Project Statistics:



Project Statistics for 'Software Development with baseline_tracking.mpp'

	Start	Finish
Current	Mon 04/01/10	Tue 18/05/10
Baseline	Mon 04/01/10	Mon 17/05/10
Actual	Mon 04/01/10	NA
Variance	0d	1d

	Duration	Work	Cost
Current	96.75d	1,540h	£0.00
Baseline	95.75d	1,532h	£0.00
Actual	2.27d	36h	£0.00
Remaining	94.48d	1,504h	£0.00

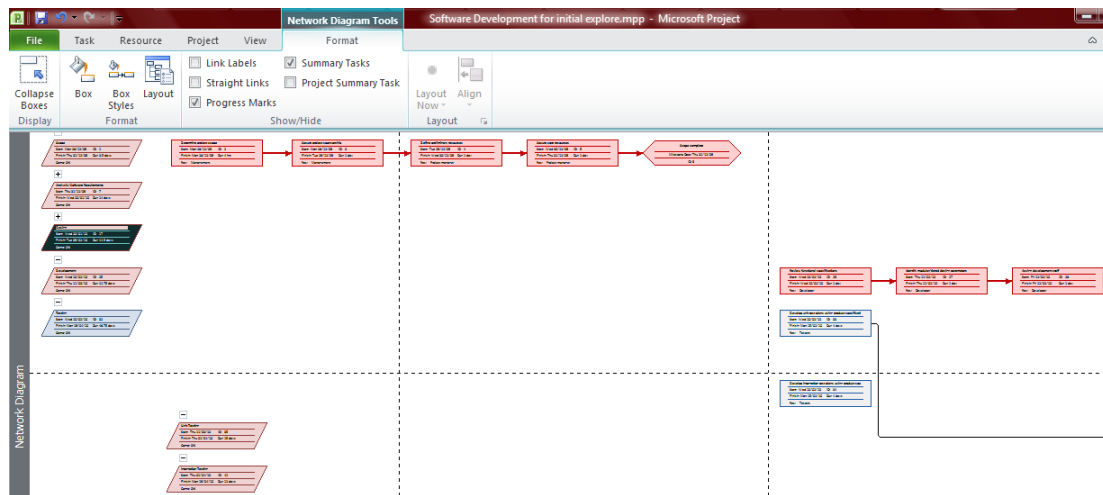
Percent complete:
Duration: 2% Work: 2%

Close

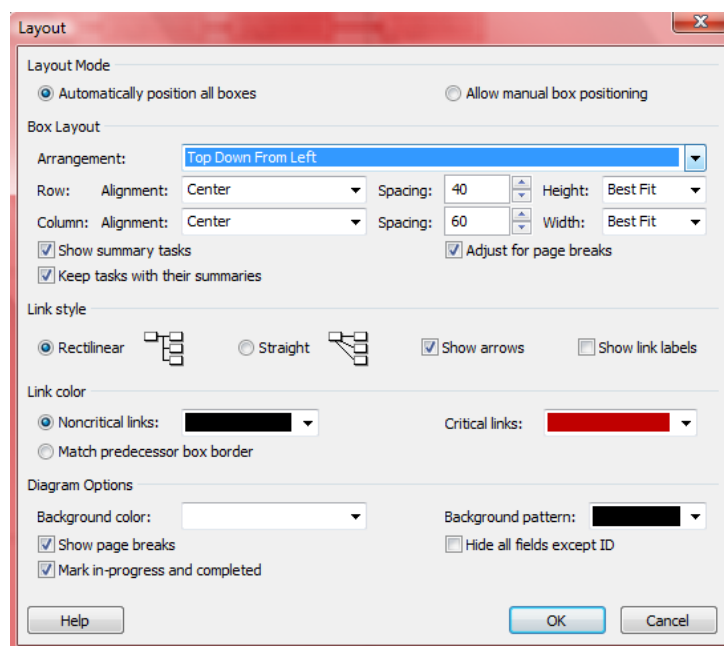
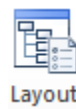
Viewing the Network Diagram

The Network Diagram (also known as a PERT chart) is another useful way to view your project, particularly the relationships between the tasks:

1. On the View tab choose Network Diagram
2. Use the zoom slider to see more of the tasks and use the scroll bars to move around the screen



3. Click the Format tab, choose Layout

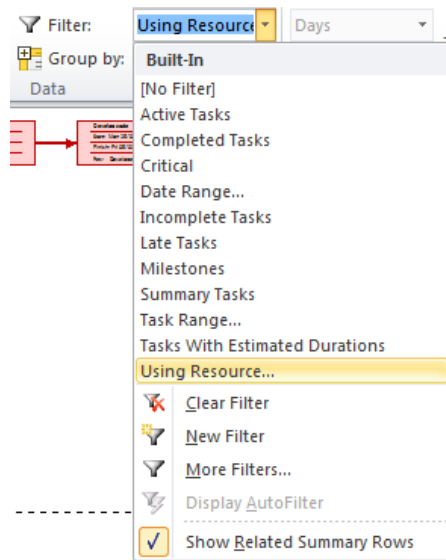


4. Experiment with the different Arrangements and Link styles

Applying a filter

You can filter the Gantt Chart or the Network Diagram in the same way:

1. Select View tab
2. Click the drop down arrow of the **Filter** command and choose the required Filter – for this exercise choose Using Resource and then select Developer to see just the tasks the Developer is assigned to.



3. Remove the filter by choosing [No Filter]
4. Return to the Gantt Chart view by clicking the first view button on the status bar (bottom right of the screen):



Exit Project

Select the File tab and click Exit to close the existing project file and the application – when prompted, do **not** Save Changes.

Introduction to Project Management

Project: - 'A planned undertaking'

The skills of project management are gathered from a wide range of experiences. Consciously or sub consciously we all apply these skills in the daily administration of our work.

Where a major undertaking has to be completed, these skills are not only brought into focus but must be applied in a much more structured format.

We must take on the jargon and techniques of the Project Manager as well as become familiar with the "Tools of the trade".

To review the skills that are relevant to project management

- The ability to define the Goal, Objective, Specifications and Limitations of a project
- The ability to define the individual tasks in sufficient detail and sequence to meet the objective with the minimum of problems, and within the defined time scale

Task attributes should include some or all of the following

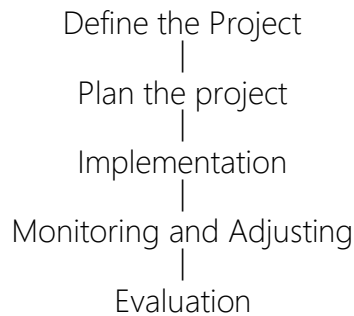
Objectives	Time constraints
Milestones	Task(s) on which this Task is Dependant
Estimated Duration: -	Task(s) that are dependent on this task
(Optimistic estimate)	Itemised task Budget
(Pessimistic estimate)	Resources required to complete the Task

- The ability to manage the progression of the tasks in terms of their resources, start times and finish times.
- The production of appropriate progress reports

As the complexities of these undertakings increase so the importance of discipline and structure increase and the Project Manager must look to the tools that can help which is where Microsoft Project comes into the picture.

The Stages of Project Management

The process of project management is divided into specific stages which can be defined as follows: -



Defining the Project

Setting out the Goal and the Objectives together with the Specification and Limitations within which the undertaking must be completed.

Plan the Project

Planning of all the activities, resources, and estimation of materials and time scales. Some of this planning may have to be done at an appropriate level for cost estimation before the project can be agreed. Once the decision to go ahead has been taken the skills of the Project Manager are used to define the details of the planning stage. When this has been completed and agreed it will become the "Plan" or the base line against which progress can be measured.

Implementation

Notes:

- A poorly planned project will take three times longer than the original plan.
- A well-planned project will only take twice as long!
- A project that will be completed without changes, on time and within budget has never been known in the past and will never happen in the future!
- Microsoft Project will help!

Monitoring and Adjusting

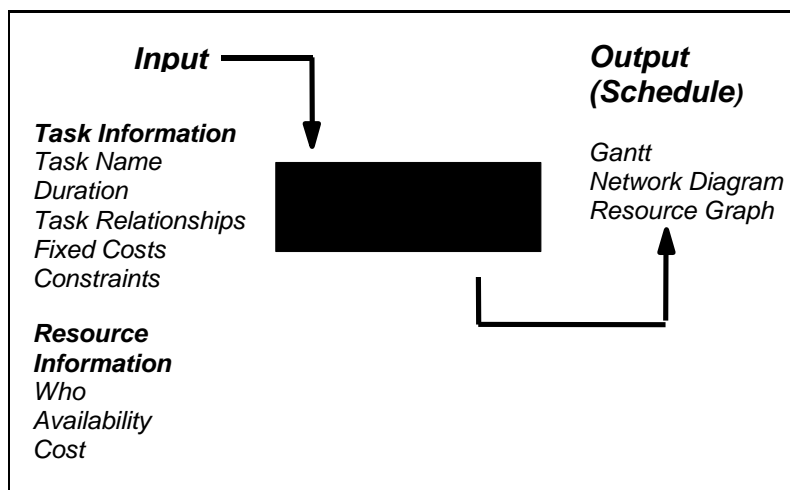
- Recording Actual Progress - Once the project is under way, the progress of each activity is recorded. This information can then be compared against the Plan and the differences highlighted.
- Revising the Schedule - The process of minimising the effect of problems and delays on meeting project deadlines is achieved by adjusting and updating the Schedule to meet the changed circumstances.

Evaluation

As the project progresses and when it has been completed the process of evaluation should be used to learn the lessons for the next time.

Understanding how MS Project helps you plan and adjust your projects

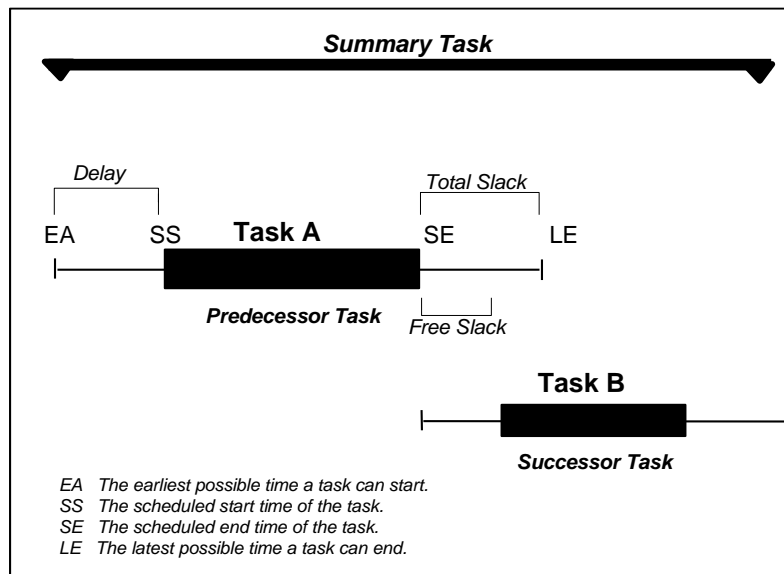
At the heart of every project management system is a *scheduling algorithm*. An *algorithm* is a mathematical or logical equation that solves a complex problem by breaking down the problem into simple steps. When scheduling resources and parameters are entered into it, the scheduling algorithm produces a project schedule that would be impossible for you to produce manually. This Input/Output model is displayed below.



In Microsoft Office Project, if you choose **Auto Scheduling**, you provide information about the project start date, resource availability, task relationships and duration. This information is fed into the “Black Box” or algorithm, to provide you with a schedule in the form of a Gantt chart. In Project you can also choose to manually schedule task (this is explained in detail in the next module).

Project Terminology

The project management industry uses specific language and terminology. Some of these terms are illustrated below.



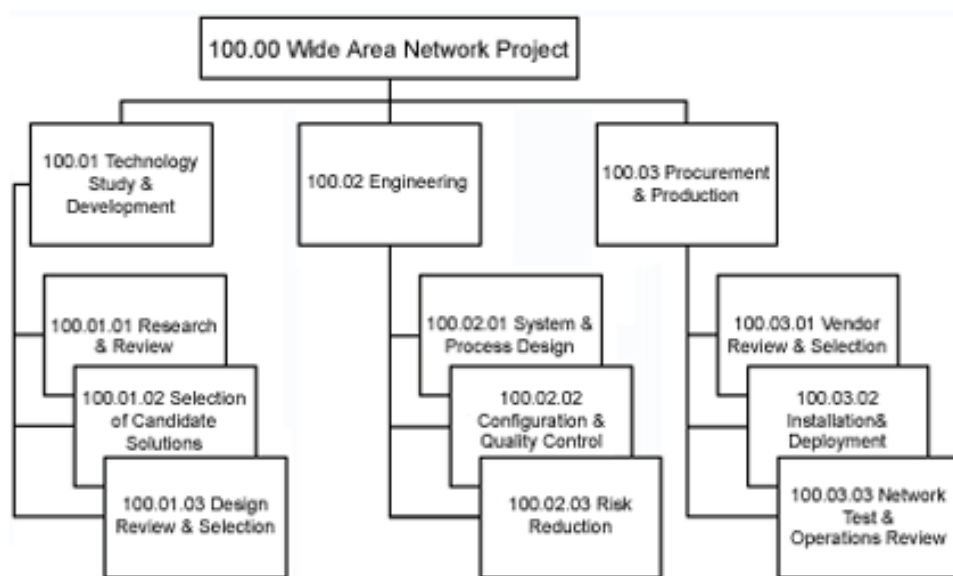
In the illustration above, two tasks have a relationship. Task A is the *predecessor task* and Task B is the *successor task*. Both of these tasks are considered to be non-critical because they both have flexibility. Let's focus on Task A. EA marks the earliest possible time Task A can start. SS marks the scheduled start time for Task A. By default, all tasks are scheduled to start at the earliest possible time, unless you specify otherwise. In the example above, Task A is scheduled to start later and therefore has been delayed. SE marks the scheduled end time for Task A, and LE marks the latest possible time Task A can end. Both of these tasks have slack, the amount of time a task can slip before it affects another task's dates or the project finish date. *Free slack* is the amount of time Task A can be delayed before affecting the start time of Task B, and *total slack* is the amount of time that Task A can be delayed before affecting the finish date of the project. The *summary task* summarizes Tasks A and B.

Critical tasks, not shown above, have no slack; therefore, delaying this type of task would mean delaying the project. A *critical path* is a series of critical tasks. All tasks on a critical path must be completed on time for the project to finish on time. If one task on a critical path is delayed, then the project is delayed. In Microsoft Office Project, a critical path is shown on the Gantt chart and the Network Diagram (alternatively known as PERT Chart) in red.

A Work Breakdown Structure (WBS)

A WBS is a top-down planning method that defines the desired end result of a project and is made up of related elements, often called work packages, work elements, work phases, or tasks (summary tasks and subtasks). WBS descriptions define how the result will be accomplished. They also help you identify logical groupings of tasks and establish the focus of the project to prevent unintended future changes.

Useful for a quick, high-level view of the parts of your project, a WBS is often shown as a block diagram.



As a deliverable-oriented grouping of project elements, a WBS chart organizes and defines the total scope of the project. Each descending level represents an increasingly detailed description of a project component.

WBS representation is described in more detail in the Level 2 course in this series.

Terminology (continued)

Actual Usage	A measure of the resource expended in completing or partially completing a task.
ALAP	Refers to a task that should be started 'As Late As Possible', using all the free-float time available.
ASAP	Used to indicate a task that should be started 'As Soon As Possible', taking into account the start date of the project and its predecessor tasks.
Baseline	<p>The original project plan, including the time schedule and resource and cost allocations. The baseline is used for comparing projected values to actuals, and facilitates the tracking and analysing of a project's progress.</p> <p><i>Note: in Project you can have several baselines to reflect your project structure.</i></p>
Cost Variance	A project tracking function recording the difference between the budgeted cost of the work performed and the actual cost. Values below the baseline show an overspend and positive values denote cost savings.
Critical Path	The sequence of tasks or activities whose schedules and durations directly affect the date of overall project completion.
Earned Value	This is a measure of a project's performance, and is calculated by multiplying a task's planned cost by the percentage of work completed.
Float (slack)	The amount of time by which a non-critical task can be delayed before it affects another task's schedule.
Gantt chart	A graphical representation of a project schedule showing each task as a bar, the length of which is proportional to its duration. Many project management packages use a spreadsheet section to the left of the Gantt chart to display additional information.
Hammock Task	A task whose duration is calculated based on the time span between its predecessor and successor activities.
Histogram	A bar chart that shows resource workloads over a time period.
Lag	The amount of time between the finish of a predecessor task and the start of a successor task.
Lead	The amount of time that a task is permitted to start before its predecessor is finished.

Terminology (continued)

Loading	A measurement of resource usage on a task per unit of time. Different methods of loading may be used depending on what's available in your project management application and what's applicable for your particular project.
Loading(back)	A loading pattern that allocates resource usage as late in the task as possible.
Loading (contour)	The contour-loading pattern assesses which resources are left over after allocation to the critical tasks and spreads these resources among the remainder.
Loading(fixed)	When using fixed-loading algorithms, you specify the actual amount of resource allocated to the encompassing tasks.
Loading(front)	Front loading systems will attempt to allocate resources as early in the task as possible.
Loading(uniform)	This loading pattern allocates the resource usage on a by day basis in a task. This will usually be done without causing any one task to be over committed.
Milestone	A project event that represents a checkpoint, a major accomplishment or a measurable goal.
Negative float	Refers to an unscheduled delay before an actual task start time that must be recovered if the project is not to be delayed.
OBS codes	Organisational Breakdown Structure codes are used to identify tasks by resource groups in a hierarchical format. OBS codes are often used to reflect departmental structure in a company or code of accounts, and can also be used for filtering tasks.
'NETWORK DIAGRAMS' (before Project 2000, were called PERT Charts)	Network Diagrams are a graphical depiction of task dependencies, and resemble flow charts. Dependencies are shown by connecting lines or arrows indicating the work flow. (PERT = <u>P</u> rogramme <u>E</u> valuation and <u>R</u> eview <u>T</u> echnique)
Predecessor	In dependency relationships, the predecessor is the task that must be started or completed first.

Terminology (continued)

Project Management	Best defined as a body of knowledge, a set of principles, or techniques dealing with the planning and control of projects.
Resource	Any person, group of people, item or equipment, service or material used in accomplishing a project task.
Resource Levelling	The process of resolving resource conflicts. Most project management programs offer an automated resource levelling routine that delays tasks until the resources assigned to them are available.
Resource Driven	Task durations determined by the program and based on the number of an allocation of resources, rather than the time available. Both individual tasks and entire projects can be resource-driven.
Sub-project	A group of activities which are treated as a single task in a master project schedule. Subprojects are a way of working with multiple projects that keep all the data in one file rather than in independent files.
Successor	In a dependency relationship between two tasks, the successor is the task that must await the start or completion of the other.
WBS codes	Work Breakdown Structure codes are used to identify tasks in a hierarchy. Many project management applications associate these codes with an outline structure. WBS codes can be used to filter the project schedule for tracking and reporting purposes.

Module 2: Planning the Project

Objectives

After completing this module you will be able to:

- Define your own project.
- Start to use MS Project.
- Amend and create project calendars.
- Save and close projects.

Defining the Project

This is the starting point for a new project.

Areas that must be completed

The Goal

This is a short statement of what the project should achieve in the broadest terms. For example, if the project is to build a new road to divert traffic away from a shopping centre the goal would be: -

To make access to the shopping centre easier for pedestrians and improve the shopping amenities for local residents.

The Objectives

The objectives can be more specific and there can be any number of them as required. To continue the example from above the following are examples: -

1. To build a road for through traffic that does not use any existing residential areas.
2. To design the road and the route to allow for the projected traffic flow for the next 20 years.

The Specification

This section will provide more detailed areas for the project, for example it may specify the broad sections of the project and at what points approvals are required before proceeding. There may be a section concerning where resources should come from.

It may also specify the management team.

The Limitations

These are the restrictions that will affect the project, for example there may be a cost limit, there could be a set of regulations that must be obeyed, and time may be a vital factor.

When these areas are clearly specified before the project starts there is a much greater chance of the project succeeding and major pitfalls being avoided. (In theory!)

Completing the Project Definition

As an exercise, define a project that can be planned in the next section and subsequently used in the following modules of the course to try out the features of the package.

Complete the following form: -

Project Title: (File Name)	
Start Date:	
Goal:	
Objectives:	
Specification:	
Limitations:	

Project Planning

This is where the experience and skill of the Project Manager must be used. At this point the project is broken down into a series of tasks.

The Project Manager must be confident that it will be possible to control the task as listed, if there is any doubt then the task should be broken down into a number of smaller tasks, each of which will be easier to control.

When defining a task the following is a guide to the information required.

- The Title
- The Objective of the Task
- The time required to complete the task.
(Give an optimistic and pessimistic estimate.)
- A note of any previous task or tasks that are associated with this task.
- The immediate subsequent tasks.
- The resource(s) that are required to complete the task.
- Any time constraints that apply.

When all the tasks have been specified together with their resources, you have completed the major part of the planning of the project.

The next stage is to examine the flow of the tasks and the utilisation of the resources.

It may well be that some of the resources are over-allocated and such problems must be resolved or noted.

At this point it will be possible to save the **Baseline Plan** against which actual progress can be measured in terms of date variances and cost variances.

Completing the Project Plan

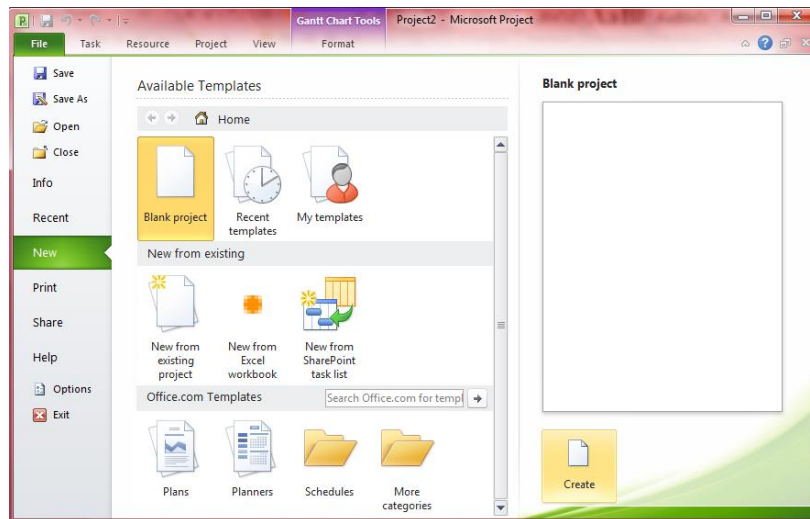
Complete the following table

Number	Task Name	Duration	Predecessors	Resources

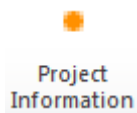
Where to begin with MS Project

When you open the Project application you are in a new blank project and you can start creating your project straight away. You can also start your project from a template or an Excel spreadsheet:

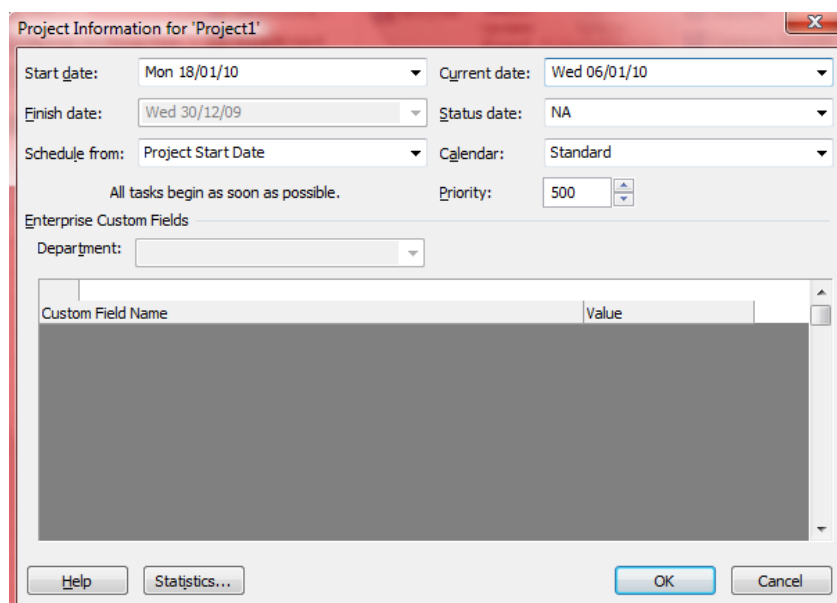
1. From the File tab, choose New.
2. Choose the required template or option:



Setting the project start date



In a new project, the first step is to enter general information about the project in the **Project Information** dialog box on the **Project** tab:



Note: If you do not enter a project start or finish date, Microsoft Project will automatically use the current date as the start date.

Planning from a start date v planning from a finish date

- If you choose to schedule from the start date, the Finish date box becomes unavailable. You set the start date, which by default is today's date, and Microsoft Project calculates the finish date based on your task information. All new tasks have a default constraint type of As Soon As Possible (ASAP)
- If you choose to schedule from the finish date, the Start date box becomes unavailable. You set the finish date, and Microsoft Project calculates the start date based on your task information. All new tasks have a default constraint type of As Late As Possible (ALAP).

Other options in the Project Information dialog box

- Project uses **the status date** to perform earned value calculations, identify the complete-through date in the Update Project dialog box, and place progress lines. If you set the status date to NA, Microsoft Project uses the current date as the status date.
- **Priority** indicates how readily tasks in the current project are delayed when resources are levelled across multiple projects. Type or select a number between 0 and 1,000, with the higher number indicating a higher priority task. Microsoft Project takes into account project-level priorities before task-level priorities when levelling.
- There are three base **Calendars**, any of which you can modify.
 - By default, Project automatically uses the Standard base calendar, which defines a Monday-Friday 8:00-5:00 work week, with 12:00 P.M. to 1:00 P.M. of non-working time for a break.
 - The 24 Hours base calendar has no nonworking time. All time, from Sunday through Saturday, 12:00 A.M. to 12:00 P.M., is set as working time.
 - The Night Shift base calendar has working times of Monday night through Saturday morning, 11:00 P.M. to 8:00 A.M., with 3:00 A.M. to 4:00 A.M. of nonworking time for a break.

- The Enterprise Custom Fields are available in the Professional version if you are connected to the Project Server.

Clicking the **Statistics** button opens the Project Statistics dialog box

	Start	Finish
Current	Mon 18/01/10	Mon 18/01/10
Baseline	NA	NA
Actual	NA	NA
Variance	Od	Od

	Duration	Work	Cost
Current	Od?	0h	£0.00
Baseline	Od	0h	£0.00
Actual	Od	0h	£0.00
Remaining	Od?	0h	£0.00

Percent complete:
 Duration: 0% Work: 0%

Close

This dialog box displays information on project start and finish dates, duration, work, and cost. It also provides comparative statistics you can use to measure the progress of your project.

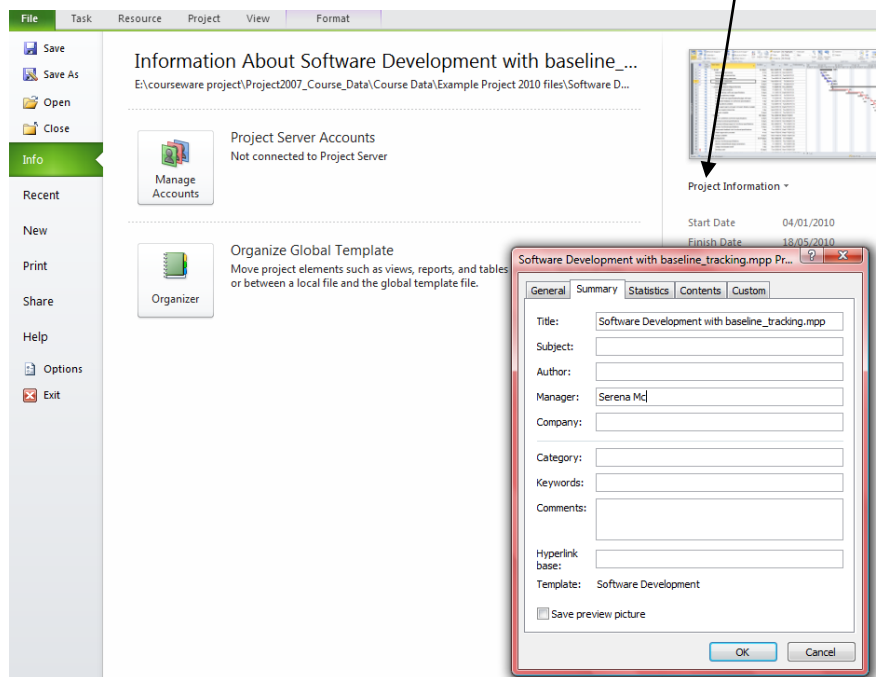
Project Properties

You can enter descriptive information about your project in the Properties dialog box. This information will help you and others identify the source and purpose of your project. The Properties dialog box consists of five tabs, described in the table below.

Tab	Function
General	Provides information about the project, including filename, file type and size, file location, size and times of file creation, most recent modification, and most recent access.
Summary	Provides fields for: Project Title, Subject, Author, Manager, Company, Category, Keywords, And Comments.
Statistics	Provides information about project file editing including date created; most recent modification, access, printing, person who last saved it, current revision number and total editing time
Contents	Contains overall schedule information, including project start and finish dates, duration, total work and cost, and percent complete.
Custom	Allows you to enter project properties by which you can search and define links to actual values in your project.

To view and change the Project Information

- 7 Select the **File** tab and from **Info**, click **Project Information/Advanced Properties**:



- 8 On the Summary tab of the properties dialog box you can type the Project Title, Manager's name, etc
- 9 Click OK when you are finished
- 10 Click the **Task** tab on the ribbon to return to the Gantt chart view.

Creating Calendars for Working/ Non-Working Time

Calendars are used by Project to determine when the work by the resources assigned to that task can proceed.

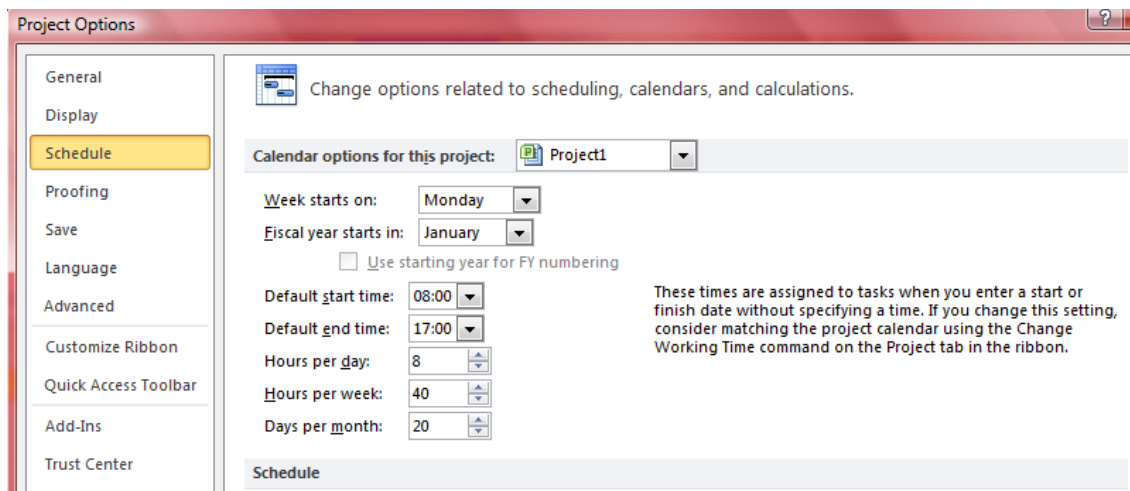
Microsoft Project comes with three base calendars of working and non-working time: Standard, 24-Hours and Night Shift. By default, the Microsoft Standard Calendar is used. You can amend any of the base calendars or create your own and you can assign different resources to different calendars. For tasks to which no resources have been assigned, the base calendar you choose to be the 'Project Calendar' is used. The 'Project Base Calendar' is set in the Project Information dialog box.

It is important that you amend the Calendars because no holidays or festivals are included.

Note: whilst all calendars will be applied, the Gantt Chart can only display one calendar - the vertical grey columns indicate the non-working time in the calendar which is currently chosen to be displayed.

Factors to Convert Duration Units into Hours

Before you create your own calendars, it helps to understand the significance of the Calendar options for 'Hours per day', 'Hours per week' and 'Days per month':



File, Options, Schedule for conversion of Duration units into hours

These three settings are not defining how many hours a resource works per day, week or month – this is done in detail in the calendars you create (see later).

These three settings are defining the conversion factors to be applied by Project to task durations you enter in days or weeks or months for conversion into hours: Project performs its calculations in hours.

Unless this point is understood, some unexpected task bar lengths can cause confusion as illustrated below where two resources are each given a 2d (2 days) task but one resource's task bar is only one day long:

				10 Sep '07														17 Sep '07	
	i	Task Name	Duration	F07	S08	S09	M10	T11	W12	T13	F14	S15	S16	M17	T18	V			
1		Test task 1	2 d																
2		Test task 2	2 d																

For example, with the conversion factor 'Days to hours' changed to 7 hrs/day, by then entering 2d Duration on each task, you are telling Project that there is $2 \times 7 = 14$ hrs work involved in each task. However, the first resource's Resource Calendar has been set to allow the resource to work 7 hrs /day but the second resource's Resource Calendar has been set to allow the resource to work 14 hrs/day and the second resource consequently covers the work within only one 24-hour day.

We can have only one setting for each of the above three conversion factors in a file.

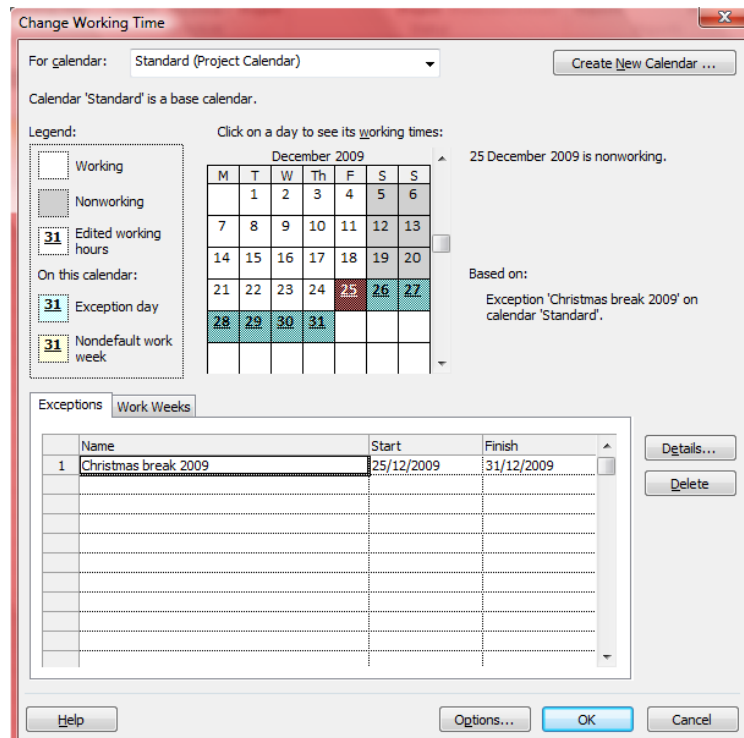
Project performs its calculations in hours. If the above graphical task bar length effect causes confusion when discussing your plan with people who do not understand the workings of Project, **enter your durations in hours** and it will not have to use the conversion factors.

After you have entered some task durations (see later), try to avoid changing these conversion factors as such changes will modify the durations you have already entered in days, weeks or months. For example, changing the 'Hours per day' from 8 to 7 will change an existing duration of 1d to 1.14d because it is still storing the 1×8 hrs work for that task as 8hrs but you have now changed **your** definition of a day to 7hrs: consequently, the duration is shown in your new definition of a day as $8/7 = 1.14$ of **your** days.

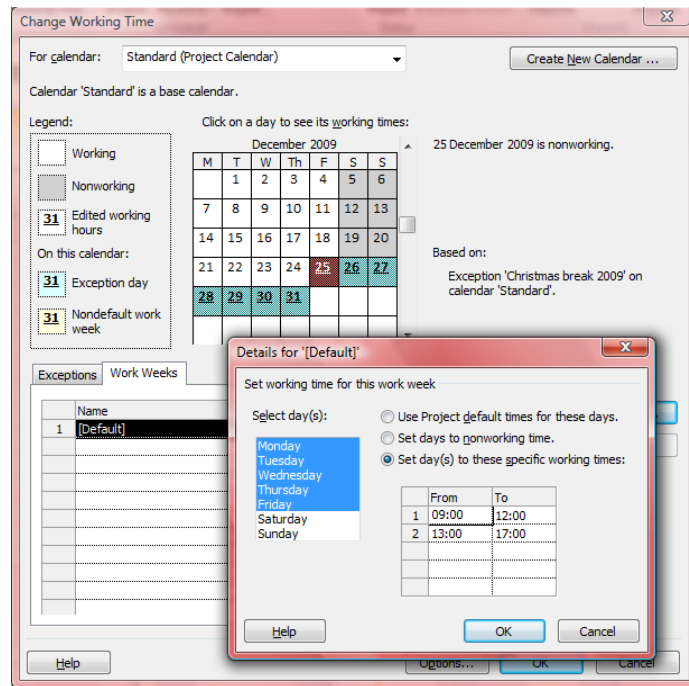
Amending the Standard Calendar



1. From the **Project** tab menu, choose **Change Working Time**

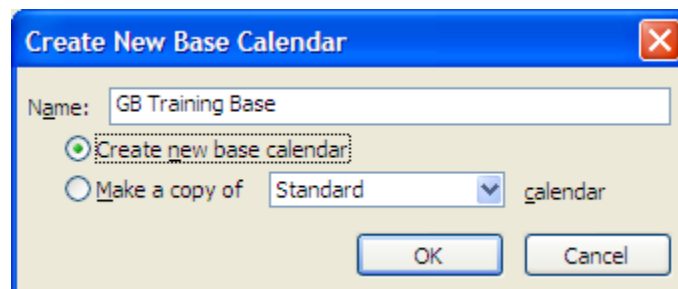


2. Use the **Exceptions** tab for non-working times like Bank Holidays - type the name of the exception and select the **Start** and **Finish** dates.
3. Use the **Work Weeks** tab to set the default working/non-working times:
 - a. on the **Default** row and click the **Details** button
 - b. for working days, select the appropriate days of the week (select adjacent weekday names by dragging or non-adjacent days by using the **Ctrl** key)
 - c. for these selected days, choose the third option 'Set Day(s) To These Specific Working Times'
 - d. type the relevant start and end times
 - e. for non-working days, select the relevant days of the week and choose the second option 'Set days to non-working time'
 - f. Click **OK** to complete your changes
4. Click **OK** to close the **Change Working Time** dialog box (this will save your changes).



Creating a New Base Calendar

1. From the **Project** tab menu, choose **Change Working Time**
2. Click the 'Create New Calendar' button.
3. In the Name text box, type your new Base Calendar's name: although not essential, it helps to include the word 'Base' for when viewing lists of your calendars in some dialogue boxes where both Base Calendar and Resources Calendar names appear.
4. Select the Create New Base Calendar option:

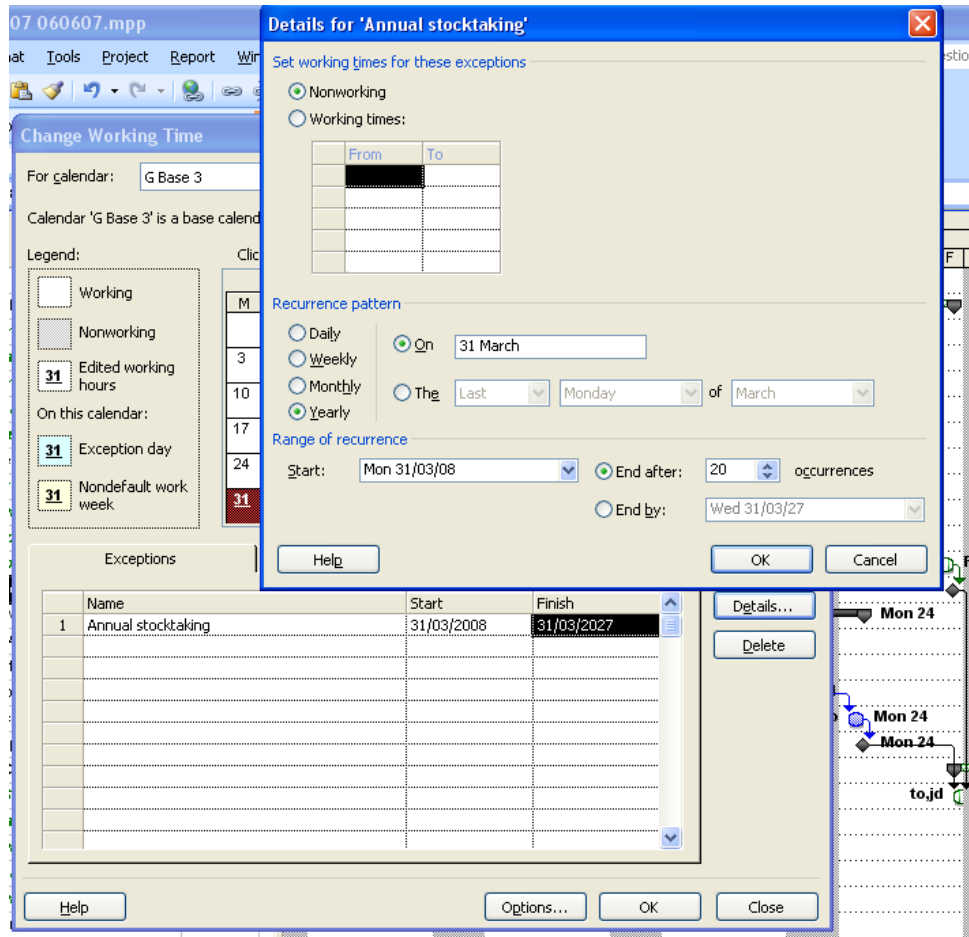


5. Click OK.
6. On the Work Weeks tab, click on the Default row and click the Details button to make the required changes.
7. On the Exceptions tab include any relevant non-working times such as Bank Holidays.

Exceptions to Work Week settings for recurring events

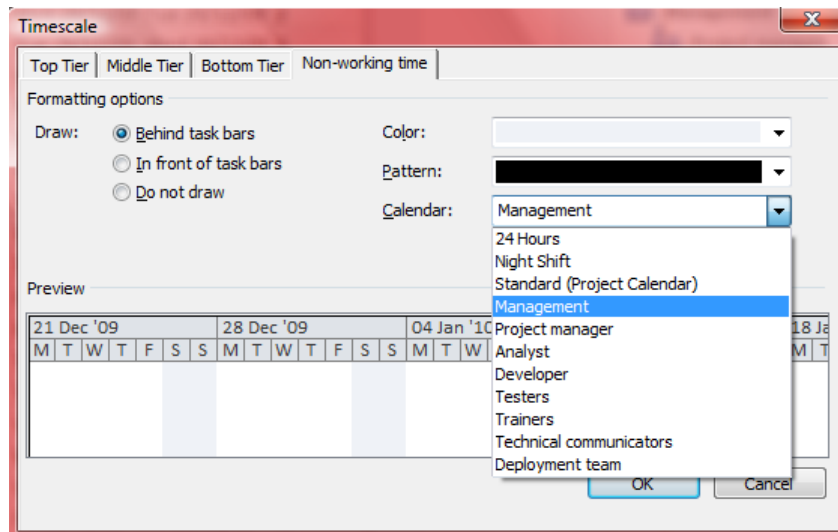
Note: this is for use only on exceptions which occur regularly weekly, monthly or occur annually on the same date(s) each year

1. Select Project, Change Working Time, Exceptions tab
2. Enter a Name for the exception and, under Details, edit as appropriate



Displaying a Specific Calendar on the Gantt Chart

1. Right click the Gantt Chart and choose Non-Working Time to display the Timescale dialog box
2. On the Non-working time tab, from the Calendar drop-down list, select the calendar from which you currently wish to display:



Note: there is no indication on the screen to remind you which calendar is currently displayed.

Saving the New Project File

Saving a Project

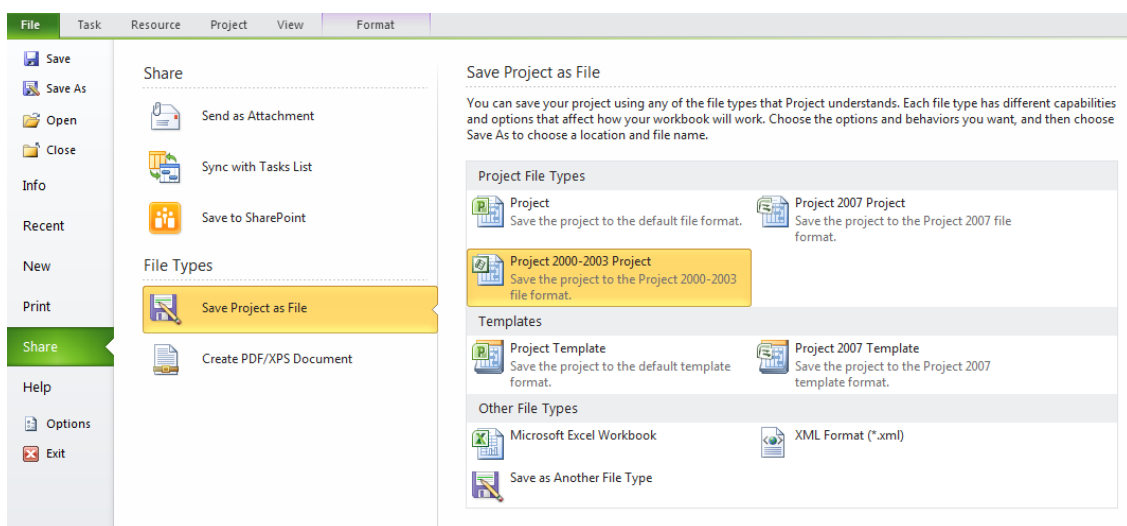
While you are working on your project, make sure that you save it regularly - it is good practice to save your project every fifteen minutes so that, if there is a power outage or power surge, you will lose only fifteen minutes of work at the most.

To save a project click on the **Save** button on the **Quick Access Toolbar** or press the keyboard shortcut Ctrl S

- A File name can contain up to 255 characters and will automatically be given a file extension of **.mpp**.
- If you open a project created in a previous version, it will open in compatibility mode and when you save it, it will be saved in the previous file format.
- click the **File** tab and choose **Save As** if you amend or update a project and wish to save a separately named copy of it.

Note: You can share Project files with people using an earlier version by saving the file in the appropriate file format:

1. On the File tab click Share
2. Click Save Project as File
3. Choose the appropriate file type
4. Select the location for the file
5. Type the file name
6. Click Save



Tip: to set Project to save automatically, you can set the Auto Save frequency

1. Click the File tab
2. Choose Options
3. In the Save section, click Auto Save and set the number of minutes
- 4.

Ending a Project Session

At various intervals, you will need to close a project and work on other ones. Alternatively, when you are finished working in Project, you will need to close all your projects and exit out of Project altogether.

Closing a Project

Once you have finished working with an existing project, you will close it. When you do this, Project asks whether you need to save the changes.

To close a project

1. From the **File** tab, choose **Close**.
2. Choose Yes to save the changes or No to close the file without saving the changes.

To close Microsoft Project and any open files

1. From the **File** menu, choose **Exit**
2. For each open project on which you have made unsaved changes, answer the question whether to save

Module 3: Task Entry and Task Linking

Objectives

After completing this module you will be able to:

- Understand the new Task Mode and how it affect the project schedule
- Enter, Delete and Edit Tasks.
- Link Tasks.
- Create a project outline using summary and subtasks
- Insert milestone and recurring tasks
- Understand how constraints and deadlines impact tasks
- Use automatic features including AutoCorrect and AutoFill

Entering tasks

This is the initial activity in setting up a new project. The system will hold task information in a Task database, used by the system whenever we view task data. This is one of three databases the system uses, the others being the Resource database and the Assignment database.

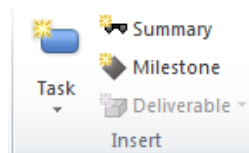
The order of entry of tasks does not need to follow any set pattern: to keep the Gantt Chart as simple as possible, enter your tasks in approximately chronological order, but this is by no means essential. You do not need to enter tasks in order of resource or resource group in order to readily see tasks being performed by a given resource or resource group because you can use filters or reports to see this information (covered later in the course).

There is no need to enter all the tasks at this stage: additional tasks can be inserted, tasks can be moved, copied or deleted. A practical approach is to initially enter only the main tasks (Summary Tasks) and afterwards fill in the detailed tasks (Subtasks): this is a 'brainstorming' stage where you and the project team are recognising all the tasks necessary to meet the project's objectives.

Do not at this stage be concerned regarding the resources for each task or the duration: concentrate on thinking of all the requirements which need to be covered by creating the necessary tasks.

Using the Gantt Chart to enter tasks

The most user-friendly way to enter tasks is to use the Gantt Chart view and the **Insert** commands on the **Task** tab:



1. Click the **Summary** command to insert your first main task and overwrite the placeholder text with the correct task/phase name:

Task Mode	Task Name	Duration	Start	Finish	28 Dec '09						
					S	M	T	W	T	F	
	<New Summary Task>	1 day	Wed 30/12/0	Wed 30/12/0							
	<New Task>										

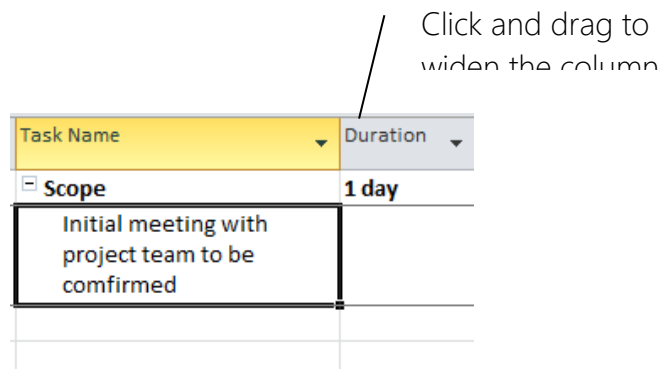
2. Click the **Task** command to enter more subtasks

3. Continue adding as many Summary tasks and subtasks as you require
 - you will need to make sure that the Summary tasks are entered at the right level and you can indent/outdent them by using the command buttons on the schedule group of the **Task** tab

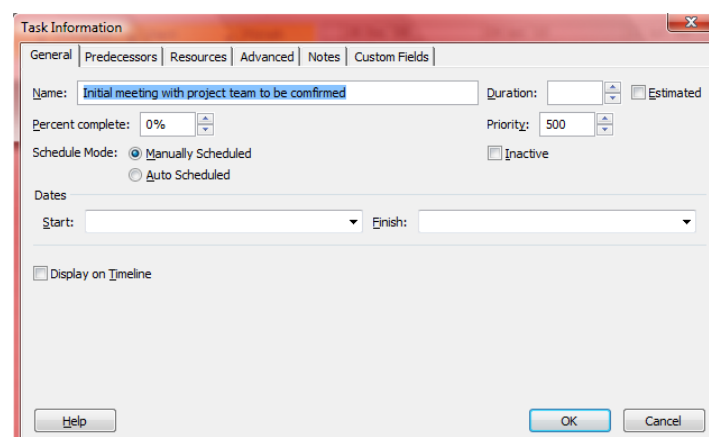


Notes:

- You can write long, descriptive task names – the text should wrap automatically in the cell and you can also change the column width if required:



- the UnDo button on the Quick AccessToolbar will undo your recent actions: by default up to 20 actions, but you can increase this to a maximum of 99 actions (on the File, Options, Advanced tab)
- The cells which are affected by your last modification are automatically temporarily highlighted in a blue colour so you easily see if other cells have been affected by the change
- It is possible to use In-Cell Editing but you may prefer to double click the task and make the changes on the general tab of the Task Information Dialog Box:



The Task Information box (**General** tab) has the following details about the task which you can edit:

Name:	The Name of the Task.
Duration:	The time the Task will take including the time units.
Estimated:	Whether the duration is estimated or not - entering a '?' after a duration means it is particularly questionable and needs to be reassessed.
Per cent Complete:	Progress on a task can be entered here, but is best entered in the Tracking dialog box: Actual Start Date, % Complete, Actual Finish Date (this is covered later in the course)
Priority:	You set the importance on a scale of 1 to 1000 for use by Project in resolving resource overallocations (1000 is high). (New for project) the default mode for new projects which allows you complete control over the project schedule (see p58 for further details)
Manually Scheduled	
Auto Scheduled	Use this if you want project to work in the same way as it did in previous versions (New for Project) Marking a task inactive greys it out on the Gantt chart:

Inactive

Task Name	Duration	'09	04 Jan '10
Example inactive task	4 days	W T F S S	M T W T F S
Planning	10 days		
Implementation	6 wks		


You might use inactive tasks if you have to cut scope – you still have a record of the tasks and any notes and information but the task is shown as deleted and doesn't have an effect on the project.

Start Date:	This is the current Scheduled Start date for the Task calculated by Project. If you are using Auto Scheduling, do not type in a start date here or on the Gantt Chart unless you want to set a Start No Earlier Than constraint on the task.
-------------	--

Finish Date:	The Scheduled Finish date calculated by Project. If you are using Auto Scheduling, do not type in a finish date here or on the Gantt Chart unless you want to set a Finish No Earlier Than constraint on the task. (New for Project)
Display on Timeline:	Displaying the tasks on the Timeline is a new visual way of displaying your project (see module 1 of the course for more information)


Manually outlining tasks into summary and subtasks tasks

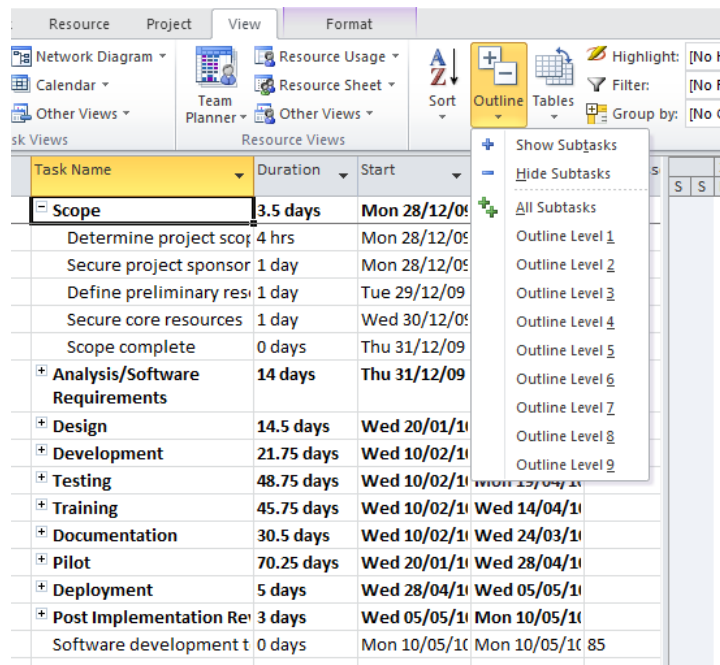
Subtasks are defined by being *indented* - the Task above **automatically** becomes a Summary Task formatted in **bold**.

1. Select the Task(s) in the Task Name column
2. Click the **Indent**  command on the **Tasks** tab to make it a sub task and note the task above it becomes bold

Tip: more than one Task can be indented/ outdented at once by selecting the required Tasks with the mouse before the indent/ outdent operation

Choosing to show all subtasks or a specific outline level

- You can click the  outline button next to the task name to show/hide the subtasks
- On the **View** tab, choose the **Outline** command to choose which level of subtasks are displayed:



Inserting an additional task

1. Select the Task that is to appear immediately below the inserted Task
2. Click the relevant command button to insert a Summary or Task.

Tip: You can also press the Insert key (Ins) on the keyboard

Note: The Task ID numbers will automatically change

Deleting a task

1. Select the whole Task record by clicking on the Task ID number
2. Press the Delete key (DEL) on the keyboard.

Note: The Task ID numbers will automatically change

Moving a task

Drag and drop

1. Select the **whole Task** on the ID number
2. **Release** the mouse button

3. Hold down the mouse button while you drag and drop the Task to the new position already visible on the screen – the task is inserted between existing tasks

Cut and paste

1. Select the **whole Task** on the ID number
2. Click the **Cut** command
3. Click on the Task Name of the task which is to be **below** the moved Task
4. Click the **Paste** command

Copying a task

Drag and drop

1. Select the whole Task on the ID number
2. Release the mouse button
3. Hold down the Ctrl key while you drag and drop the Task copy to the new position already visible on the screen – the copied Task is inserted between existing Tasks

Copy and Paste

1. Select the **whole** Task on the ID number
2. Click the **Copy** button
3. Click on the Task Name of the task which is to be **below** the moved Task
4. Click the **Paste** button – the copied Task is inserted between existing Tasks

Using AutoFill to enter repeat data

As in Microsoft Excel, in any table view in Project you can use the '*Fill Handle*' for fast entry of repeat information. For example, you don't have to type out repeat durations or resource names:

ID	Task Name	Duration	Start Date	Finish Date	Resource
4	Define preliminary resources	1 d	08/01/08	09/01/08	Project manager
5	Secure core resources	1 d	09/01/08	10/01/08	Project manager
6	Scope complete	0 d	10/01/08	10/01/08	
7	Analysis/Software Requirements	15 d	10/01/08	31/01/08	Analyst
8	Conduct needs analysis	5 d	10/01/08	17/01/08	Analyst
9	Draft preliminary software specifications	3 d	17/01/08	22/01/08	Analyst
10	Develop preliminary budget	2 d	22/01/08	24/01/08	Analyst
11	Review software specifications/budget with team	8 h	24/01/08	25/01/08	Analyst
12	Incorporate feedback on software specifications	1 d	25/01/08	28/01/08	Analyst
13	Develop delivery timeline	1 d	28/01/08	29/01/08	Analyst
14	Obtain approvals to proceed (concept, timeline, budget)	8 h	29/01/08	30/01/08	Analyst
15	Secure required resources	1 d	30/01/08	31/01/08	Analyst
16	Analysis complete	0 d	31/01/08	31/01/08	
17	Design	14.5 d	31/01/08	20/02/08	Analyst
18	Review preliminary software specifications	2 d	31/01/08	04/02/08	Analyst
19	Develop functional specifications	5 d	04/02/08	11/02/08	Analyst
20	Develop prototype based on functional specifications	4 d	11/02/08	15/02/08	Analyst
21	Review functional specifications	2 d	15/02/08	19/02/08	Management

Click the bottom right corner of the cell and drag

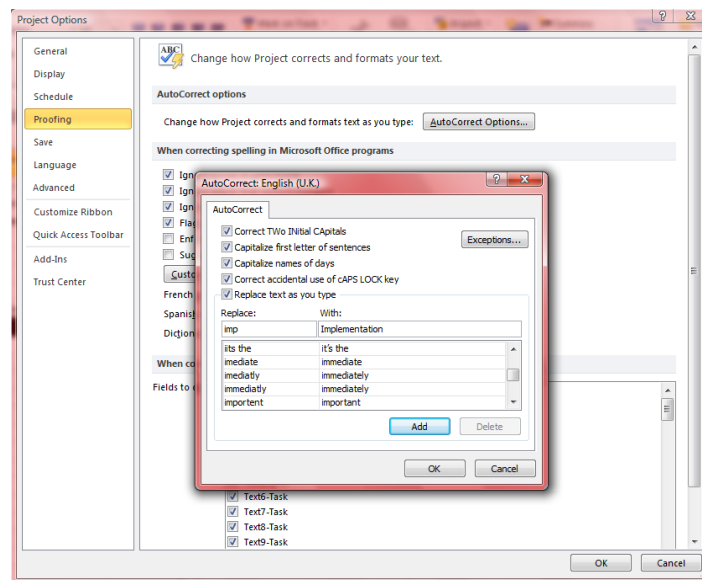
Using AutoComplete

Like with Excel, when you type something similar to information that is already in the same column of data, Project will automatically offer to complete the entry.

Using AutoCorrect

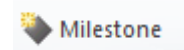
AutoCorrect automatically corrects mistyped words and expands abbreviations as you type. Project provides an extensive list of predefined typing corrections and abbreviations, and enables you to customise the list by adding your own:

1. Click the File Tab, choose Options, choose Proofing
2. Type the name of the entry in the Replace text box.
3. Type the name of the replacement in the With text box.
4. Click Add and then click OK



Entering a milestone task

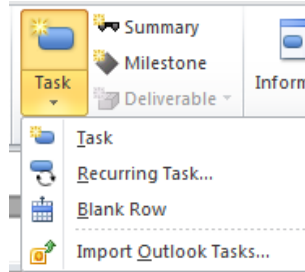
Select where you want to insert the task and click the Milestone command.



Note the format of the Milestone symbol on the Gantt chart: **◆ 01/01**

Adding a recurring task.


5. Select the task above which you want the recurring tasks or select a blank task row.
6. Click the bottom part of the insert Task command and choose Recurring Task:



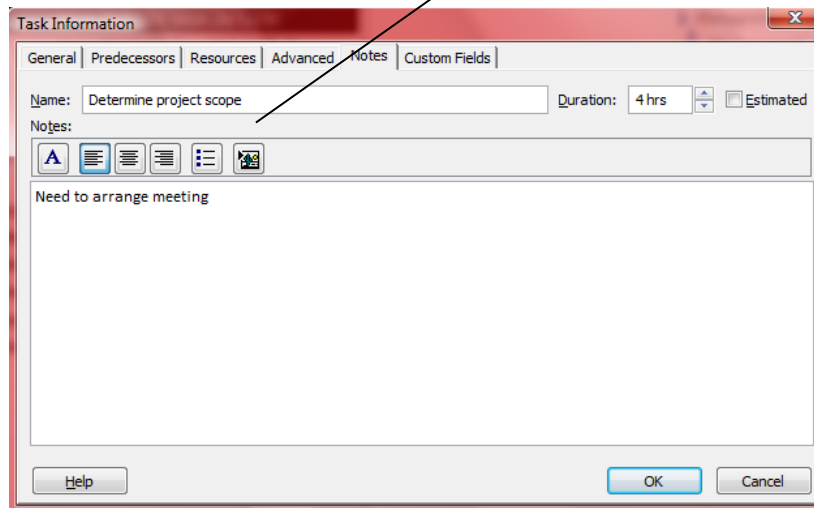
7. In the Recurring Task Information dialog box enter the name and duration of the tasks and set the recurrence pattern:


Note: By default, when inserting a recurring task, it continues until the current finish of the project, but if your project finish date changes, the recurring task dates will NOT automatically change.

Adding a note to a task

1. Select the task and click the Notes command on the Task tab  Notes
2. With the flashing cursor in the Note text area, type your note or click the Insert Object command to attach relevant documents such as Excel spreadsheets or the minutes of a meeting

Click here to
attach a



Note: a Note indicator  will appear in the Task's Indicators field

- for a quick view of the Note's first paragraph, point the mouse at the Task's Note indicator
- to **view all** of a Task Note or to **edit** a Note, click in any of the Task's fields and again click the Task Notes button on the Standard toolbar **or** double-click the Note indicator in the Indicators field
- Task Notes can be printed out with your project plan

Manually apply colours to selected cells for emphasis

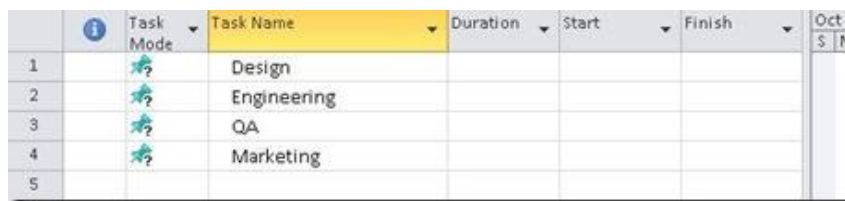
1. Select the cells
2. Click the Background Color command on the Task tab of the ribbon



Understanding the new Task Mode in Project

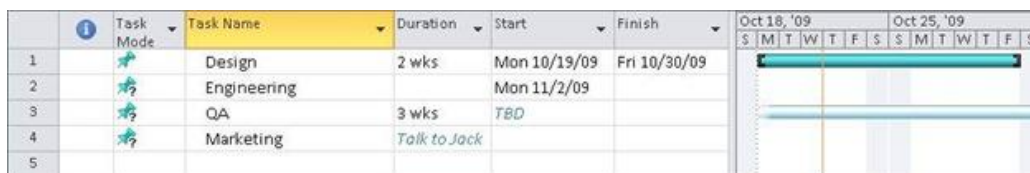
In Project there is a new concept called 'User-Controlled Scheduling'. It's a collection of features designed to make Project a more flexible planning and schedule management tool. The idea is that you, as the project manager, can have complete control over when a task should happen. If and when appropriate, you can leverage Project's powerful scheduling engine to help forecast the date of a task based on various factors like dependencies, calendar, constraints, etc. But at any time, you have the flexibility to manually override Project's automatic calculations to better capture all of the high-level, possibly vague information that you have when you start your project.

Tasks are by default "Manually Scheduled", meaning that you have complete control over their dates. For example, when you start typing tasks the Start, Finish & Duration fields are blank. When tasks are in this 'Manually Scheduled' mode, Project will not automatically calculate and fill in dates for you.



	Task Mode	Task Name	Duration	Start	Finish	Oct 18, '09
1	?	Design				
2	?	Engineering				
3	?	QA				
4	?	Marketing				
5						

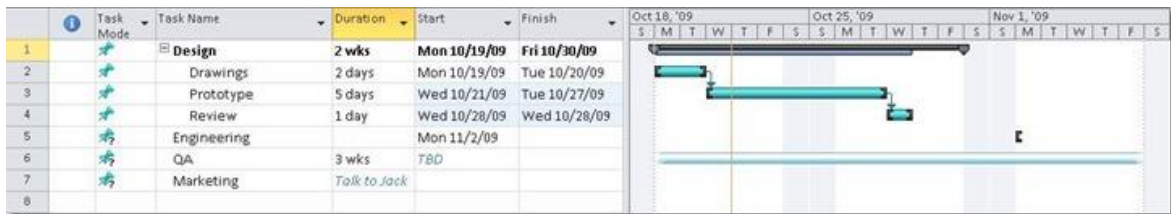
If you have specific dates for some tasks and just a rough idea for others you can enter the information, even using text in the duration, start or finish columns:



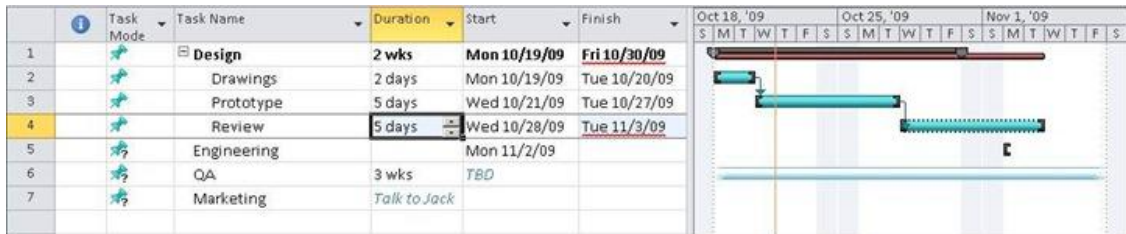
	Task Mode	Task Name	Duration	Start	Finish	Oct 18, '09	Oct 25, '09
1	?	Design	2 wks	Mon 10/19/09	Fri 10/30/09		
2	?	Engineering		Mon 11/2/09			
3	?	QA	3 wks	TBD			
4	?	Marketing	Talk to Jack				
5							

In Project you can start with high level planning and put duration or dates against a summary task, leaving the details of the subtasks to be filled in later (as opposed to the bottom up approach of the previous versions of Project where you had to start by defining all the specific work items which then rolled-up the total for each phase):

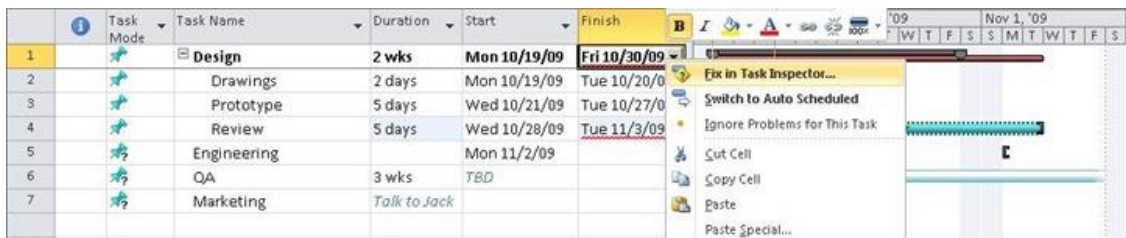
Note in the next screen shot that there is a small blue bar under the Design summary bar - this is the roll-up of all of the subtasks. If the subtasks' dates are updated, the blue bar will automatically update. This provides a visual way of indicating whether there is buffer time in the schedule.



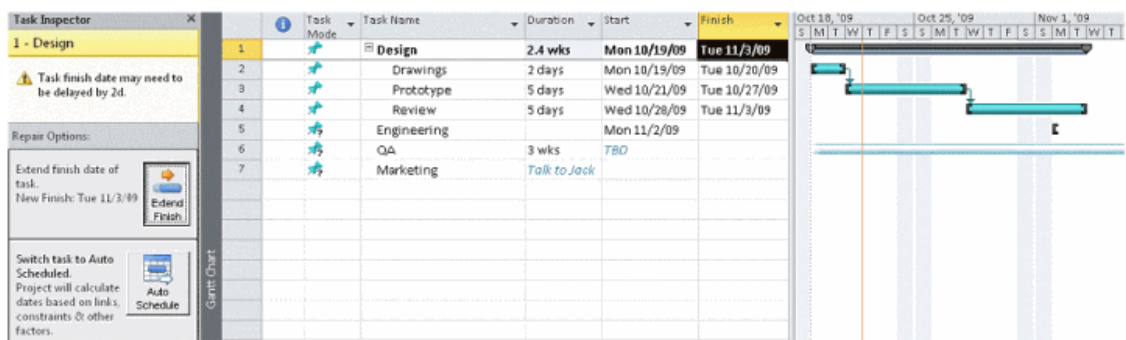
If one of these tasks end up taking longer than expected, and the subtasks end up exceeding the original dates of the summary phase, the roll-up bar will turn red to indicate a slippage:



Notice the red squiggles under the dates – the new 'schedule-checker' highlights potential problems with the schedule. And just like the spell-checker in Word, you can right click on the squiggle to see some possible corrective actions:

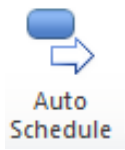


Choosing 'Fix in Task Inspector' option will bring up a side pane that will provide information – in this case, the schedule is slipping beyond the original 2 weeks planned for the Design phase and we have the option to extend the finished date:



Another example where "Manually Scheduled" mode could be useful is when a task's predecessor slips. Instead of automatically moving the linked task, a red squiggle underneath the Finish Date indicates a potential problem. This gives you,

the project manager, a better way of spotting problems and a chance to decide on a mitigation plan.



At any point, if you wish to have Project calculate your schedule for you instead of maintaining manual control, you can toggle your tasks to 'Auto Schedule' mode. When tasks are Auto Scheduled, Project will calculate and update their dates automatically just like it has always done in previous versions.

Note: Manual Scheduling was not available in previous versions of project so if you are working in compatibility mode you can only use Auto Scheduling.

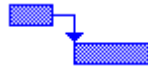
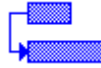

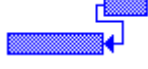
Working with task durations and relationships

Entering task durations

- You can type durations in units of *minutes*, *hours*, *days* or *weeks*. Project can figure out most spellings or abbreviations for a time unit.
- You cannot type combinations of units such as 3 weeks 2 days. You can type fractional units such as 3.4 weeks, but if a unit of time does not divide evenly, you should use whole units instead. For three weeks and two days, type 17 days, which assumes three five-day work weeks plus two extra days.
- You can enter an estimated duration by typing a question mark, e.g. **3 wks?** You can then filter for tasks with estimated durations.
- If a task extends over nonworking days (such as Saturdays and Sundays), Project displays the Gantt bar over the nonworking days but *does not count* them towards the completion of the task.
- To include nonworking days, specify elapsed duration by prefixing an **e** to a unit of time. Use the following abbreviations: *emin* (elapsed minute), *ehr* (elapsed hour) *eday* (elapsed day), or *ewk* (elapsed week), for example, **3eday** specifies a full **72-hour period**.
- If a subtask is manually scheduled, you can choose the start and finish dates for the task and this will calculate the duration. Do **not** do this for an Auto Scheduled task unless you mean to put a constraint on the task.
- If a summary task is Auto Scheduled it's duration is automatically calculated from the overall duration of all it's subtasks; however you can change the mode to manually scheduled and enter a different duration for summary task if you need to.

Creating task relationships

Tasks can be linked to other Tasks with the following relationships:

Relationship	Description	Gantt Bar Chart Display
Finish-to-start (FS)	Task starts when its predecessor finishes.	
Start-to-start (SS)	Task starts when its predecessor starts.	
Finish-to-finish (FF)	Task finishes when its predecessor finishes.	
Start-to-finish (SF)	Task finishes when its predecessor starts.	

Setting up a Finish to Start relationship link between two tasks

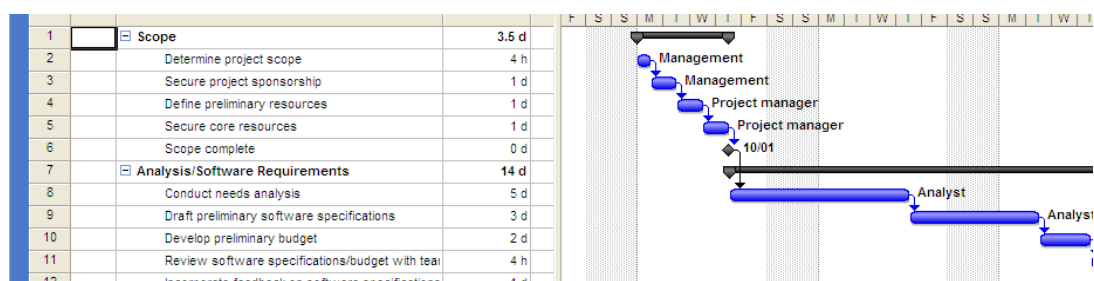
1. Select the two Tasks in the required order Finish to Start (using the CTRL key to select them if they are not next to each other)

2. Click the **Link Tasks** command on the Tasks tab of the ribbon



Tip: You can link several tasks at once by selecting them then clicking the link command

Note: To avoid problems in using some of the more advanced features such as Resource Automatic Levelling, do not link Summary Tasks to each other but link their relevant subtasks:



For example, Do not link task 1 to task 7:
link the last subtask of task 1 (=6) to the first subtask of task 7 (=8)

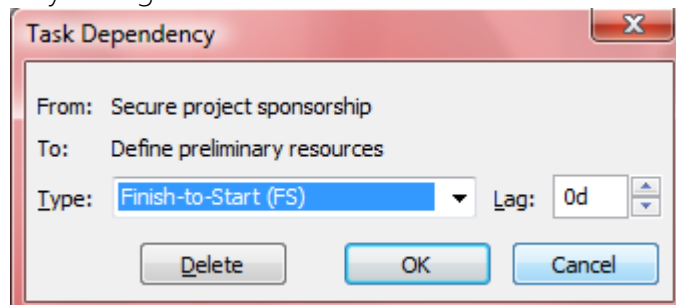
To unlink tasks

1. Select the Tasks
2. Click the Unlink Tasks button



Editing the relationship between two tasks

1. Double-click the link in the Gantt chart to display up the Task Dependency dialog box:



2. Choose from the required relationship from the Type drop down list

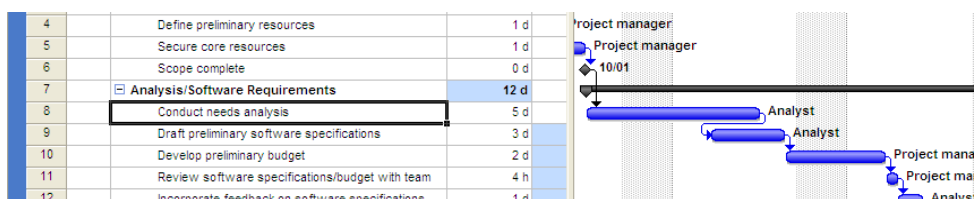
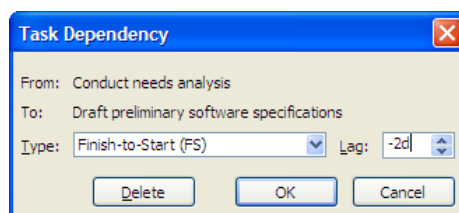
Using lag time and lead time

With **Lag Time** you can **delay** the start of the Successor Task by a defined time period following the finish of the Predecessor Task

With **Lead Time** you can schedule an **overlap** between the finish of the Predecessor Task and the start of the Successor Task so that the Successor Task starts at a defined time period before the finish of the Predecessor Task

A **Lead-Time** is entered as a **negative** Lag Time

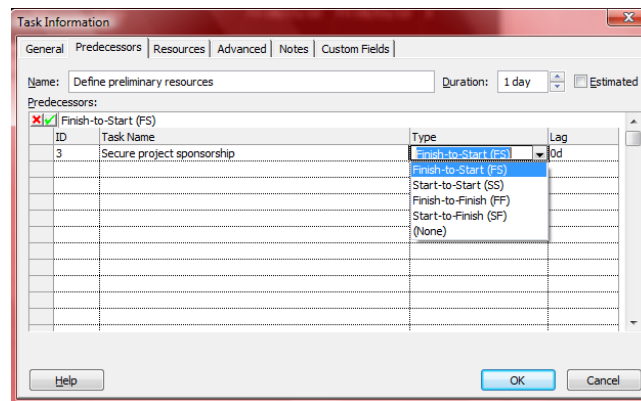
1. Double click the relevant link line on the Gantt chart to display the Task Dependency dialog box
2. Enter an amount (in hours/days/weeks) in Lag box:



Lead entered as negative lag to give partial overlap of Tasks 8 and 9

Alternative for viewing/changing a task's relationship links

1. Double click a task to display the Task Information Dialog box and click the Predecessors tab
2. Click the Type drop down list to change the type
3. If necessary enter the lag
4. Click OK

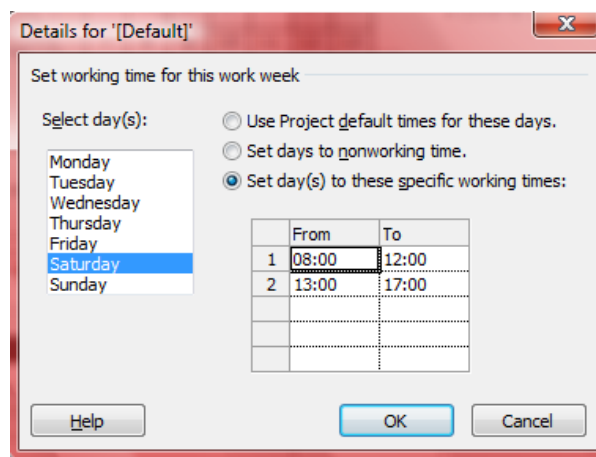


Exercise: Creating a new project

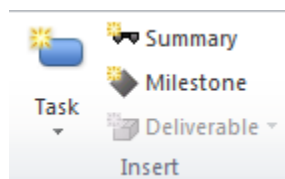
The project you will create is based on the following fictitious project scope:

The project is the production of an IT training course manual, similar to the one you are reading. It must contain separate written modules (8 of them) and it all must be based on some technical appraisal of the software (studies and specification) and authoring of each of the modules. Finally, a slide show must be created to accompany the paper course manual.

1. Create a new blank Project file
2. Save the project with the name **MyTrainingCourse**.
3. Title the Project Word Training Manual and enter your name as the manager of the project
(Click the File Tab – Project Information – Advanced Properties)
4. The start date should be one month in the future to the nearest Monday.
(On the Project tab, click Project Information and change the Start Date)
5. Amend the Standard calendar so that all Saturdays are set to be working days using the same standard hours of 08:00-12:00 and 13:00 to 17:00.
(On the Project tab, click Change Working Time; on the Work Weeks tab click the Details buttons and change Saturdays):

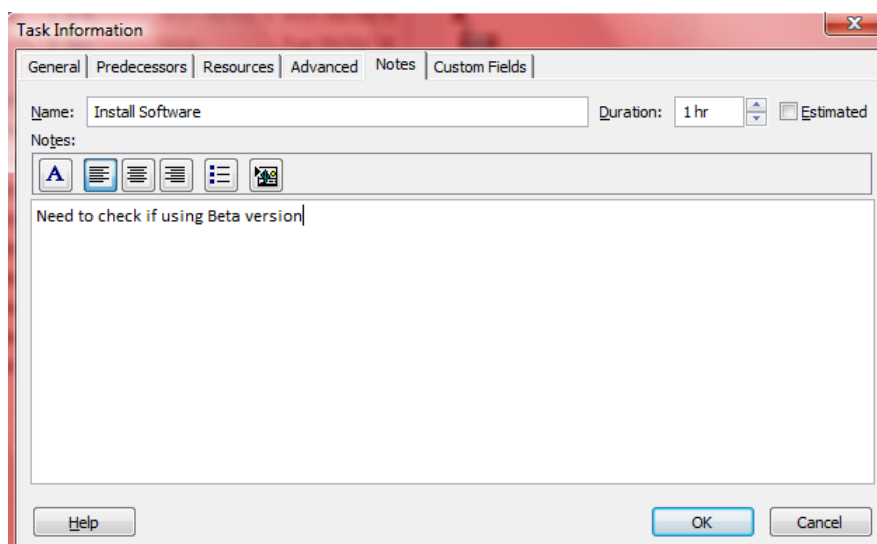


6. Enter the following tasks using the Insert Summary/Task/Milestone command buttons on the Task tab of the ribbon as appropriate.

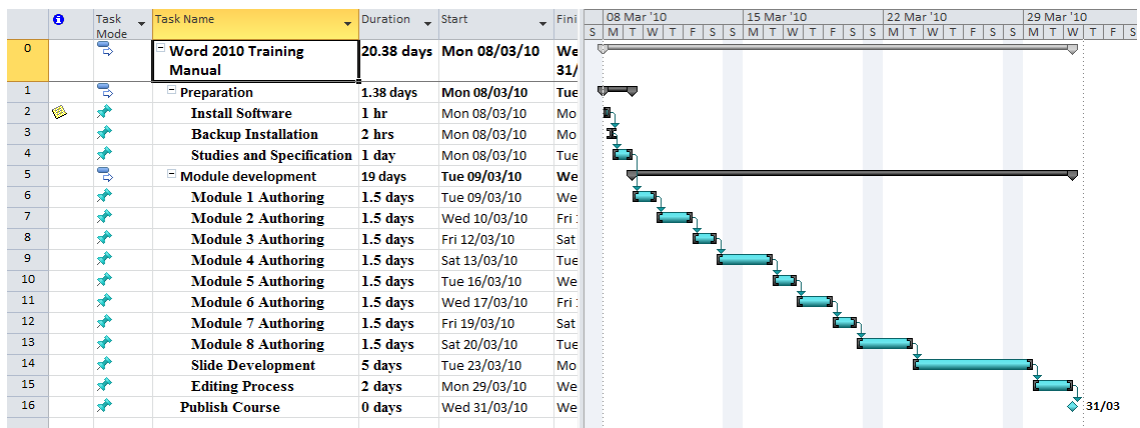


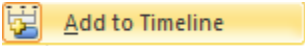
<i>[This column is for your information only]</i>	Task	Duration
Summary task	Preparation	Calculates itself
Sub task	Install Software	1h
" "	Backup Installation	2h
" "	Studies and Specification	1d
Summary task	Module Development	Calculates itself
Sub task	Module 1 Authoring	1.5d
" "	Module 2 Authoring	1.5d
" "	Module 3 Authoring	1.5d
" "	Module 4 Authoring	1.5d
" "	Module 5 Authoring	1.5d
" "	Module 6 Authoring	1.5d
" "	Module 7 Authoring	1.5d
" "	Module 8 Authoring	1.5d
" "	Slide Development	5d
" "	Editing Process	2d
Milestone Task	Publish Course	0d

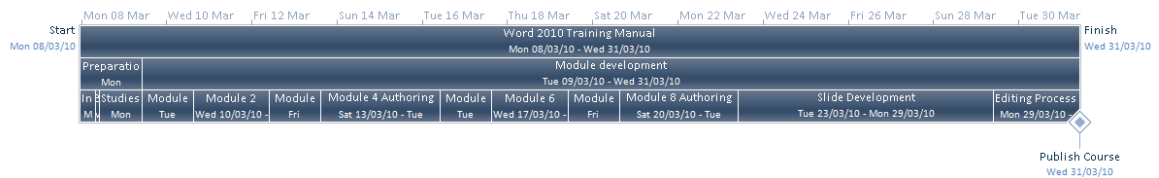
7. Add a note to the Install Software task:



8. Display the **Project Summary Task** – an option on the **Format** tab
9. Link the tasks together with a Finish to Start relationship – your project should look similar to the screen shot on the next page:



10. Select all the tasks, right click and choose  Add to Timeline
- the Timeline of your project should look similar to the following:



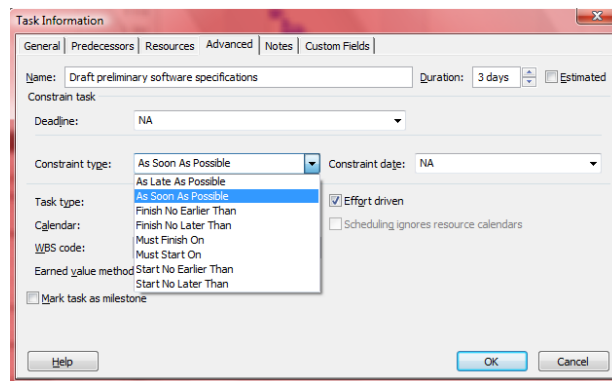
11. Save and close the project.

Creating constraints for tasks in Auto Schedule Mode

Utilising task constraints

Certain tasks in your project may require to be “constrained” to a fixed date. If you are using Manual Scheduling mode, you simply choose the required dates from the Start/Finish columns. Manual Scheduling was not available in previous versions of project so if you are working in compatibility mode you can only use Auto Scheduling and therefore you need to understand how to utilise task constraints.

Constraints are entered in the Task Information box on the Advanced Tab:



There are eight different types of constraints:

Constraint type	Description
As Late as Possible	Starts the task as late as possible, depending on other task constraints and relationships. You do not need to enter a date to use this constraint
As Soon as Possible	Starts the task as soon as possible, depending on other task constraints and relationships. You do not need to enter a date to use this constraint. This is the default and is <i>equivalent to having no constraint</i>
Finish No earlier than	Constrains the task to finish on or after the date that you enter in the Date box
Finish no later than	Constrains the task to finish on or before the date that you enter in the Date box
Must Finish on	Constrains the task to finish on the date that you enter in the Date box. You can manually enter this constraint by typing a date in the Finish field in the Gantt table
Must Start On	Constrains the task to start on the date that you enter in the Date box. You can manually enter this constraint by typing a date in the Start field
Start No Earlier than	Constrains the task to start on or after the date that you enter in the Date box
Start No Later than	Constrains the task to start on or before the date that you enter in the Date box

Notes:

- If you set a constraint, Project displays a constraint icon in the Indicators column:

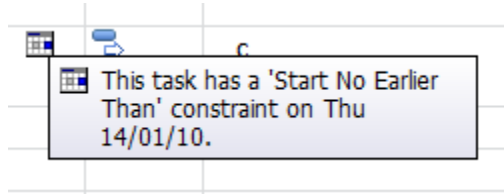


a **red** dot means an **inflexible** Constraint
for example: Start/ Finish No Later Than
Start/ Finish On

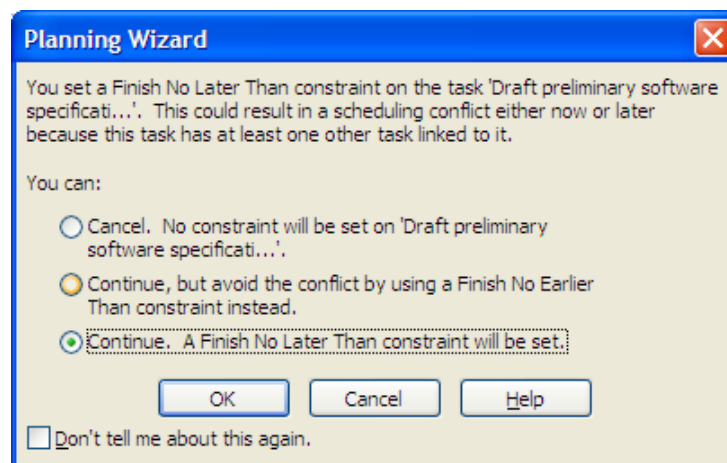


a **blue** dot means a **flexible** or 'moderate' constraint
for example: Start/ Finish No Earlier Than

- to display the **Constraint details** hover the mouse over the Constraint icon:



- If the task is linked to a predecessor, Project may display a **Planning Wizard** dialog box warning you about possible current or future conflicts:

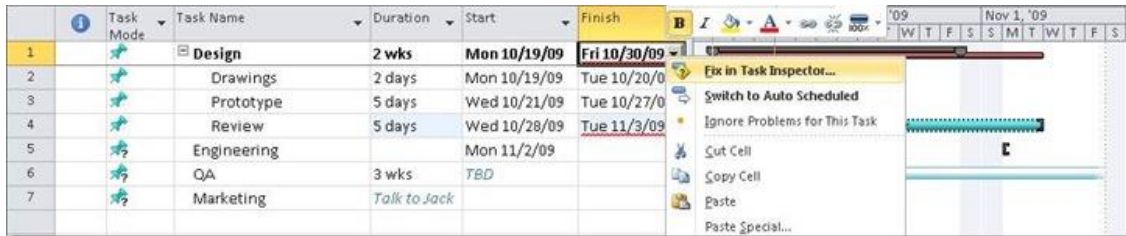


In this case you would choose the third option 'Continue' to set the constraint if you were sure you wanted to fix the date of the task.

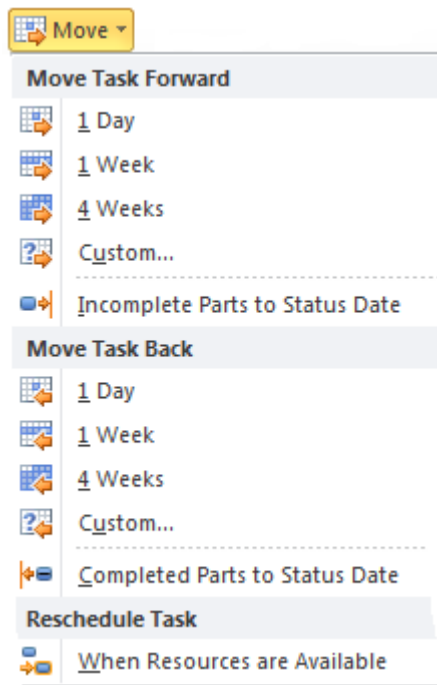
- If you wish to remove a constraint that you set earlier, change the constraint type to **As Soon As Possible**. Although it is in the constraint list, it is the same as having no constraint.
- the Gantt Chart can be filtered for tasks with constraints by using the criteria 'Tasks With Fixed Dates' – filters are explained later in the course

Resolving scheduling conflicts

When using Manual Scheduling, you will see red squiggles under task dates if project considers there is a problem with the schedule and you can use the Task Inspector to help you resolve the problem:



You can also use the new **Move** command on the **Task** tab to quickly move tasks forward or back in time:



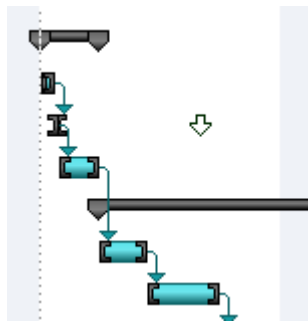
Note: If you are in Auto Schedule Mode, using the Move command will put a constraint on the task.

When using Auto Scheduling, conflicts can arise when a task is calculated to start/finish on a date that is too early/late in the light of its own constraint or due to its relationship to a successor task that has a constraint. You can identify which tasks

have constraints by viewing the Indicators field for constraint indicators; then if possible, alter the conditions which impose the constraint and remove it or consider modifying/ removing the relationships between the tasks.

Setting a deadline on a task

A deadline on a task is not as rigid as a constraint. You can use deadlines in both Auto and Manual Scheduling mode – when you set a deadline you see a green arrow on the Gantt chart:



To set a deadline date on a task, double click the task to display the Task Information dialog box and on the Advanced tab, choose the deadline date.



Project will allow a task to slip beyond its Deadline, but in the Indicators column it will display a warning Indicator

To remove a deadline date on a task, double click the task to display the Task Information dialog box and on the Advanced tab, clear the deadline date box.

Quick Reference

Change the project start date	On the Project tab of the ribbon click Project Information
Amend the project calendars	On the Project tab of the ribbon click Change Working Time
Go to the Row of a Specific Task or to a Specific Date	Press the F5 key and type the row number
See the Gantt Bar of a Selected Task	Select the task and click the Scroll to Task command on the Task tab of the ribbon

Change the Calendar from which the Gantt Chart Non-Working time is displayed	On the background of the Gantt Chart, right-click and choose Non-Working Time – select the required calendar from the drop down list
Link tasks and change the link type	Select the tasks and click the Link toolbar button to create the relationship; double click the actual link on the Gantt bar to change it.
Display the Unique ID field which does not change when Tasks are inserted/ deleted:	Right-click the Task Name column heading and choose, Insert Column - choose Unique ID – this numbering is in the order of Task creation
Show the Task outline number grouping Tasks within their Summary Tasks:	On the Format tab of the ribbon, click the option Outline Number
Format the appearance of Task bar Links	On the Format tab of the ribbon click the Layout command
Display/ Format Gantt Chart Gridlines	On the background of the Gantt Chart, right-click and choose Gridlines
Locate Tasks or Resources that meet criteria in selected fields:	On the Task tab of the ribbon use the Find command
Navigate faster in Tables by:	<div>HOME goes to the start of the current row</div> <div>END goes to the end of the current row</div> <div>CTRL + HOME goes to the first field in the first Task</div> <div>CTRL + ↑ goes to the top of the current column</div> <div>CTRL + ↓ goes to the bottom of the current column</div>
Navigate faster in the Gantt Chart timescale by:	<div>ALT + HOME goes horizontally to the start of the project</div> <div>ALT + END goes horizontally to the end of the project</div> <div>ALT + PgUp/Dn 'pages' sideways</div>
Rename, delete or copy a Base Calendar (and other customised items) between projects:	File tab – Info - Organizer

Module 4: Resources and Resource Management

Objectives


At the end of this module you will have

- An understanding of the various information required to enter resources
- Assigned resources to the tasks
- Changed individual resource calendars/availability
- Modified task assignments
- Completed the end of the design and planning stage and set a baseline for the project.

Creating resources

Resources are the people, equipment and supplies required to complete a particular task. You do not have to include resources in your project but by defining and then assigning resources to tasks you accomplish several goals:

- You are able to track the whereabouts of resources
- You can identify potential resource shortages or over allocation that could force you to miss scheduled deadlines and which, in turn, could possibly extend the duration of your project.
- You can identify under-utilised resources – and if you reassign these resources, you may be able to shorten the project's duration.

When working in Auto Schedule mode, assigning a resource to a task can affect the duration of the project because work on the task cannot begin until the resource is available. Project uses a resource calendar to define the working days and times for a resource, but the resource's availability also depends on other tasks to which you assigned the resource. If the work assigned to a resource exceeds the resource's time available, Project assigns the resource to the task and indicates that the resource is over allocated by showing a red person icon in the Indicators column 

Using the Resource Sheet to enter resources

The Resource Sheet view allows you to enter and view resources, costs and other information.

1. Display the Resource Sheet by clicking the last view button on the status bar:



2. Type the name of the Resource (i.e. John Smith or simply 'Builder')
3. Choose the **Resource Type** (Work/Material/Cost).
Work resources are people or equipment
Material resources are supplies, stock, or other consumable items used to complete tasks in the project. Examples of material resources include concrete, steel, pipe, wood, and glass. When you set up a material resource, define the **Material Label**, or unit of measurement, for the material. Label examples include metres, tons, and boxes. Material resources are different from work resources:
 - The overtime rate and workgroup fields are disabled.
 - Unit availability cannot be specified.
 - Material resources don't use resource calendars.

Examples of cost resources could be travel or accommodation – and it is now much easier to track this kind of cost in project (Cost resources are covered in detail in the level 3 course)

4. The first initial of the Resource Name appears in the Initials column – overtype this with the specific initials you want to use to refer to that resource in certain views and reports
5. The Group column is an optional text field that you can use to sort and find specific types of resources
6. Type the maximum number of units available to you – e.g. you may have 3 plumbers so you would type 300%, but against named individuals you would type 100% (or 50% if they are only available to you part time)
7. Enter the Standard rate of pay – this can be per hour, day, week or year
8. If the resource gets paid overtime, fill in the Ovt Rate column
9. The Cost per Use can be in addition to or instead of the standard rate – e.g. this could be an administration or delivery charge for equipment, or a rate for the job regardless of the time taken to complete it.
10. The Accrue At field provides choices for how and when a resource's costs are to be charged, or accrued, to the cost of a task. The options are Start, End or Prorated (default). Example - One of the resources on the project is a consultant whose hourly fees are paid upon completion of assigned tasks. In the Accrue At field in the Resource Sheet view, select the End option. As each of the consultant's assigned tasks is marked complete, the consultant's fees are charged to the task.
11. Click in the Base Calendar field and click on the list arrow at the right of the field to assign a calendar for that resource. Project uses the Standard Project calendar by default. Calendar information is used to schedule all working and non-working days for a particular resource and you can create additional base calendars if necessary.
12. To apply an alphanumeric code to a Resource (for example for cost centre accounting), use the 'Code' field

Tip: You can quickly enter duplicate information by using dragging the 'Fill Handle'

Assigning and amending a resource calendar

1. In the Resource Sheet Base Calendar column, select the relevant Base Calendar:

Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Code
Gen Manager	Work		GM		100%	£50,000.00/yr	£0.00/h	£0.00	Prorated	Standard	
Project manager	Work		PrM		100%	£45,000.00/yr	£0.00/h	£0.00	Prorated	Standard	
Analyst	Work		An		100%	£35,000.00/yr	£0.00/h	£0.00	Prorated	Standard	
Developer	Work		Dev		100%	£32,000.00/yr	£0.00/h	£0.00	Prorated	Developer Base	
Testers	Work		Test		100%	£25,000.00/yr	£0.00/h	£0.00	Prorated	24 Hours	
Trainers	Work		Tr		100%	£25,000.00/yr	£0.00/h	£0.00	Prorated	Developer Base	
Technical communicators	Work		TecC		100%	£24,000.00/yr	£0.00/h	£0.00	Prorated	Night Shift	
Deployment team	Work		Depl		100%	£32,000.00/yr	£0.00/h	£0.00	Prorated	Standard	
Fuel Oil	Material	litre	f_o			£0.90		£0.00	Prorated		
Stationary	Material	box	st			£3.50		£0.00	Prorated		

2. Double click the Resource to display the Resource Information Dialog Box and click the **Change Working Time** button
3. Edit on the Exceptions or Workweeks tabs as described earlier for setting up a Base Calendar, although here you leave the Work Weeks tab Default Details unchanged as they reflect the default settings in the Base Calendar on which the Resource Calendar is based:

Change Working Time

Resource calendar for 'Developer':

Base calendar: Dev_Test_Base

Legend:

- ☐ Working
- ☐ Nonworking
- ☒ Edited working hours
- ☒ Exception day
- ☒ Nondefault work week

Click on a day to see its working times:

February 2010

M	T	W	Th	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

Working times for 25 February 2010:

- 08:00 to 12:00
- 12:30 to 17:30

Based on:

Default work week on calendar 'Dev_Test_Base'.

Exceptions

Name	Start	Finish
1 Holiday	11/01/2010	13/01/2010
2 Attending conference	26/02/2010	26/02/2010

Details... Delete

Help OK Cancel

Note: the name of the underlying Base Calendar is displayed beneath the name of the Resource. Any subsequent changes you make to a Base Calendar will be automatically reflected in any dependant Resource Calendars.

Resource Availability Dates

1. In the Resource Sheet, double click a resource to display the Resource Information dialog box
2. On the General tab, enter the Resource's overall dates of availability for the project:

Resource Information

General | Costs | Notes | Custom Fields

Resource name: Developer Initials: D

Email: Group:

Windows Account... Code:

Booking type: Committed Type: Work

Material label:

Default Assignment Owner:

Generic ☐ Budget ☐ Inactive ☐

Change Working Time ...

Resource Availability

Available From	Available To	Units
04/01/2010	29/01/2010	50%
01/02/2010	31/03/2010	100%

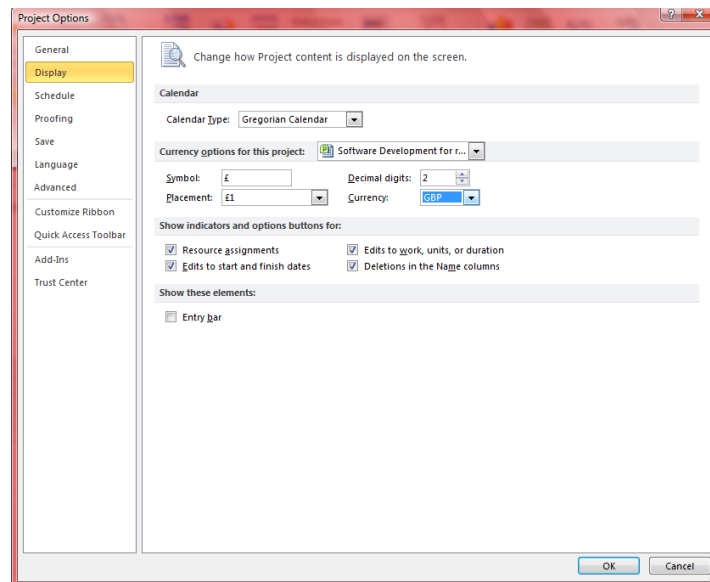
Help Details... OK Cancel

3. A series of Available From or To or both can be entered to contour the availability of the resource for this project, with varying max Units
4. Resources allocated to Tasks outside these dates will be shown over allocated
5. Use this facility to register availability/ non-availability of the Resource over long periods, not for short periods such as holidays
– use the Resource Calendar for shorter periods

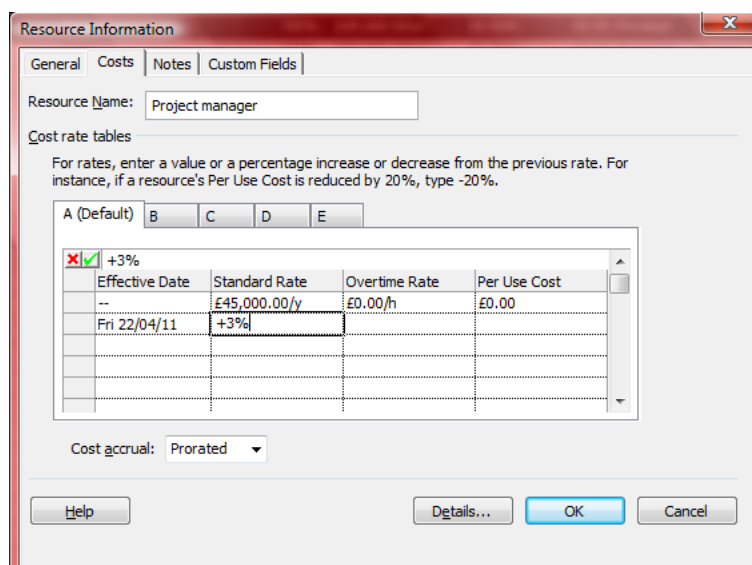
Resource Costs

You can use Project with entering any costs. If you are going to include costs you can change the currency symbol used:

Click File, Options, Display to edit the currency options:



In addition to entering cost information on the Resource Sheet, you can build in profiles of how the rates are expected to change over time and for different 'types' of work: Double click a resource to display the Resource Information Dialog Box and on the Costs tab, enter the Resource's future Rates and Costs Per Use (you can enter the rate itself or a % increase or decrease):



Note: There are five tabs (A-E) representing five different cost rate tables - you can create different Cost Rates for different types of work:

Understanding how cost per use is calculated

Allocating resources with max units set to under 100%

For example, allocating a Resource with **Max Units = 50%**, Cost/Use = £200 to a 1 day = 7 hrs Duration Task will result in the following:

Duration	= 1 day
Work	= 3.5 hours
accrued cost/use	= £100

Modifying the Resource's Max Units to 100% will not change the scheduled costs for tasks already allocated to this resource, but allocation of the modified resource to future tasks will attract the full £200.

Allocating resources to a task at less than 100% effort

For example, allocating a Resource with Max Units = 100%, Cost/ Use = £200 to a 1 day = 7 hrs Duration Task **at 25% Units on the Task** will result in the following:

Duration	= 1 day
Work	= 1.75 hours (7h/d *25%)
accrued cost/use	= £50

Modifying the Resource's Units on the Task to 100% will immediately change the scheduled cost for the Task to include the full £200 Cost/ Use.

Exercise: Enter resources

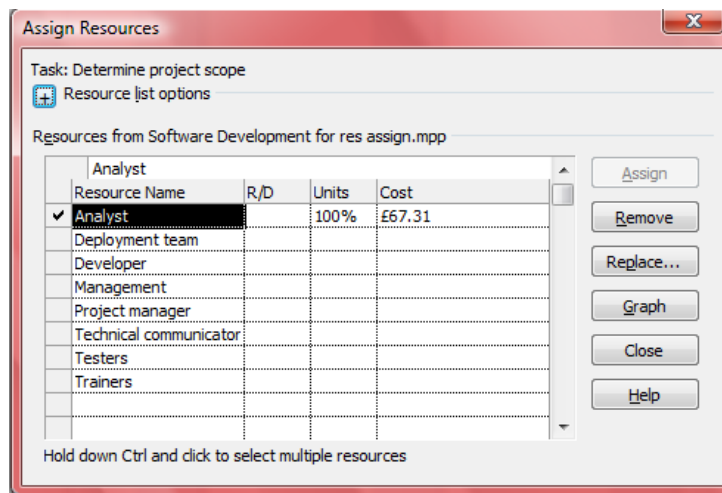
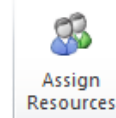
8. Open the project **MyTrainingCourse** that you created previously.
9. Enter the following **work** resources in the Resource Sheet

Resource Name	Initials	Group	Units	Std. Rate	OVT. Rate
Terry Wogan	T	BBC	100%	£200.00/h	£300.00/h
Mark Woolway	M	Team Leader	100%	£25.00/h	£50.00/h
Emma Cheesman	E	Contractor	100%	£15.00/h	£30.00/h
Julian Cook	J	Contractor	100%	£15.00/h	£30.00/h
Madeleine Adams	M	Contractor	100%	£15.00/h	£30.00/h
Nick Pavey	N	Contractor	100%	£15.00/h	£30.00/h
Richard Buller	R	Contractor	100%	£25.00/h	£50.00/h
Jamie Price	J	Contractor	100%	£10.00/h	£20.00/h
Binding	B	Printing	100%	£12.00/h	£12.00/h
Copying	C	Printing	100%	£10.00/h	£10.00/h
Technician	T	Contractor	200%	£12.50/h	£20.00/h

10. Save the project.

Assigning resources to tasks – Auto Schedule Mode

1. In the Gantt Chart view, select the Task
2. On the Resource tab of the ribbon click the Assign Resources command
3. In the Assign Resources dialog box, from the Resource list select the Resource and click the Assign button:



Note: the Resource's Units on this Task are by default set to the Resource's Maximum Units for this project set in the Resource Sheet, but you can edit the Resource's Units on this Task to a lower % if required. The costs for a work type resource are displayed but cannot be amended here.

Tips:

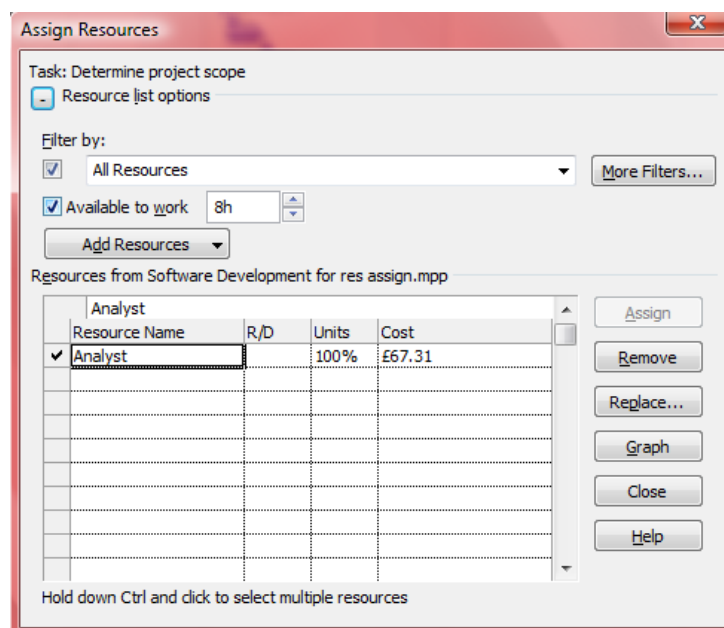
- you can leave the dialog box open for assigning to other Tasks
- to assign the same Resource(s) to more than one Task at a time, select the Tasks before using the Resource Assignment dialog box
- to assign more than one Resource to Tasks, select the Task(s) and select the Resources in the dialog box before clicking the Assign button
- use SHIFT or CTRL to select contiguous or non-contiguous Tasks
- the Task Duration does **not** change on the first assignment of Resources to a Task, even if you assign more than one Resource – the Work hours for **each** Resource are by default equivalent to the full Duration. However, if you **later** assign **additional** Resources to the Task, the workload is shared – see below on how to have **complete control over the split of the work between multiple resources on a task**

- by default the resource name is displayed on the Gantt chart - you can choose to display the initials (or any other data) against each Task bar – (this is covered later in the course).

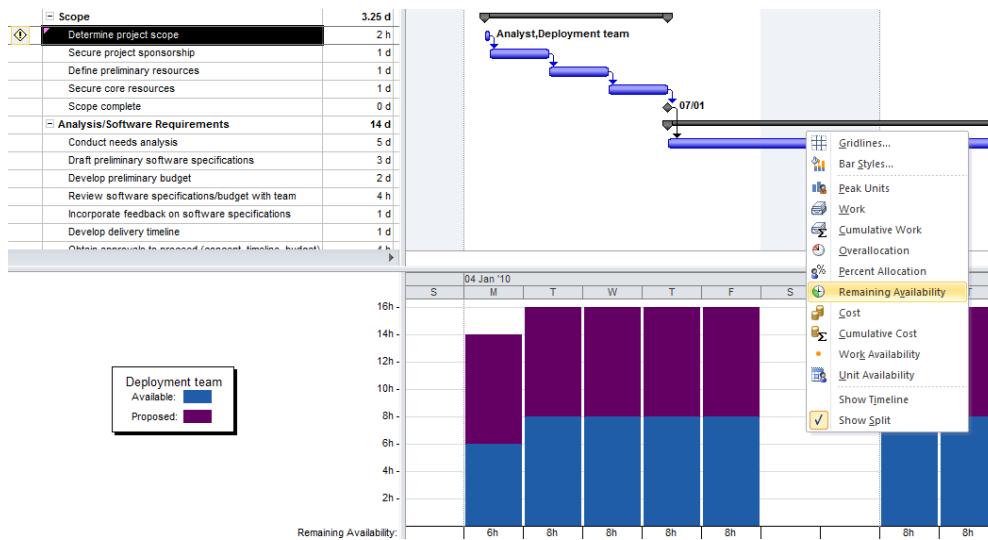
Assistance in finding resources with available working time

In the Assign Resources dialog box:

1. Click the Resource list options to expand the dialog box
2. Tick the Filter by check box and make sure All Resources is displayed (alternatively you can filter for a specific resource group, etc)
3. Tick the 'Available to work' check box and enter the number of hours availability for which you are searching
4. The list of resources will be automatically filtered:



Note: In the Assign Resources dialog box, there is a Graph button. This feature has changed from the previous versions of project. When you click the Graph button you will see a split screen view with the Gantt chart in the top half of the screen and the Resource Graph view in the bottom half. You can right click the graph to display further details:



Assigning additional resources to reduce task duration

If you later assign additional resources to a task, by default the work on the task is initially **shared equally between the Resources** and the **Duration is reduced**.

However, you can modify the work allocated to each resource using the Task Entry View:

1. In the Gantt Chart, click the Details command on the Task tab to split the screen and place the Task Form in the bottom half.
2. Right click the form and choose **Work**:

The screenshot displays the Microsoft Project interface. On the left, the 'Gantt Chart' pane shows a task list. Task 8, 'Conduct needs analysis', is selected. The main area shows a Gantt chart with a task bar for 'Conduct needs analysis' starting on 07/01 and ending on 14/01. The 'Task Entry Form' is open at the bottom, showing details for task 8. The form includes fields for Name, Duration (5 d), Start (Thu 07/01/10), Finish (Thu 14/01/10), and a list of resources. The 'Resources' list shows 'Analyst' with 100% units and 40h work. The 'OK' button is highlighted.

ID	Resource Name	Units	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
3	Analyst	100%	40h	0h	0h	0h	40h

3. Assign another resource using the drop-down list of resources as shown above
4. In the form, you can edit the Work against each Resource assigned to the Task to give your required split of Work – the Task Duration is automatically recalculated (you are **not** bound to stay with the original total hrs work)
5. Click the Form's OK button (pressing Enter is not the same here as OK)
6. In the form, you can also change the Units of each resource on the task and this will also recalculate the duration of the task

7. Edit the Task Duration in either half of the screen and notice that the work for the work for the **Driving Resource(s)** is automatically recalculated

How project recalculates the task duration in Auto Schedule mode

Assigning a Resource to a Task defines the hours of Work for the Task:

$$WORK = DURATION \text{ hours} \times RESOURCE \text{ UNITS}$$

When you **first** allocate Resource(s) to a Task, the **initial** hours of Work for each Resource on the Task are calculated as the Task Duration expressed in hrs

When **subsequent changes** are made to the **number of resources** assigned to the task or to any of the allocated Resource **Units** or to the **Resource Work hours**, the Task Duration is ***automatically recalculated for each Resource*** in the course of recalculating the Task Duration:

For each allocated resource, the following is automatic:

$$RESOURCE \text{ DURATION HOURS} = RESOURCE \text{ WORK} / RESOURCE \text{ UNITS}$$

- Project identifies the Resource which spends the longest number of hours in real time on the Task as calculated by the above expression – this Resource is termed the 'Driving Resource'
- the task duration is automatically recalculated to the hours between the first resource starting work on the task and the last resource finishing work on the task, in accordance with their Resource Calendars
- by default, if you modify the split of the Resources' Work, MS Project will recalculate the Duration as above
- if you modify the Resources' Units on the Task, MS Project will recalculate the Duration as above
- if you modify the Duration, MS Project will recalculate the Work for the Driving Resource(s)
- by default, MS Project will not change the Resources' Units on the Task
- on a Task allocated to multiple Resources which do not all share the same Calendar From and To daily working hours settings, the start and finish of

the Task will be determined by the above Driving Resource calculation in combination with the individual Resource Calendars' From and To times

NOTE: Resources do not have to be assigned to Summary Tasks

Using Material Resources

Assigning variable material consumption

Used where consumption **varies** with the Task Duration or the length of time of the Assignment. Enter the rate of consumption in the **Units** field of the Assign Resources dialog box, for example **4/h**:

Assign Resources

Task: Produce lab scale product

+ Resource list options

Resources from Software Development for res assign.mpp

	Resource Name	R/D	Units	Cost
✓	Product engineering		100%	£16,000.00
✓	Raw material		4 Litres/h	£12,800.00
	Analyst			
	Deployment team			
	Developer			
	Management			
	Project manager			
	Technical communicator			
	Testers			
	Trainers			

Hold down Ctrl and click to select multiple resources

Assign Remove Replace... Graph Close Help

Assigning fixed material consumption

Used where consumption does **not** vary with the Task Duration nor the length of time of the Assignment.

Enter in the **amount in the units field**, for example for 100 litres just type 100 and the label will appear automatically:

Assign Resources [X]

Task: Produce lab scale product

+ Resource list options

Resources from Software Development for res assign.mpp

Resource Name	R/D	Units	Cost
✓ Product engineering		100%	£16,000.00
✓ Raw material		100 Litres	£1,000.00
Analyst			
Deployment team			
Developer			
Management			
Project manager			
Technical communicator			
Testers			
Trainers			

Hold down Ctrl and click to select multiple resources

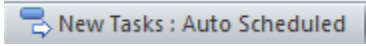
Buttons: Assign, Remove, Replace..., Graph, Close, Help

Exercise: Assigning resources to tasks

Manual vs Auto Schedule Mode

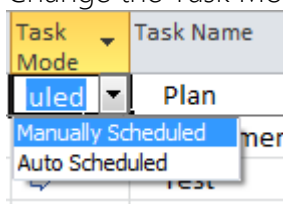
The new Manual Schedule mode has an impact on the way resources are scheduled.

The easiest way to see this is to open the project file called **2 - Example Task Mode.mpp** and follow the exercise:

1. Make sure the project is in Auto Schedule Mode – on the Status Bar it should say 
2. Go to the Resource Sheet view, double click Caroline Bell and click the Change Working Time button – notice that she has a holiday booked for the 6-8 Jan
3. In the Gantt Chart notice that the Plan task is due to finish on 15 Jan
4. On the Resource tab click the Assign Resources button and assign Caroline to the Plan task – notice that whilst the task remains at 10 days duration, it is now planned to finish on 18 Jan because of Caroline's holiday
5. Look at the Resource Usage view – note that Caroline is scheduled to do 80 hours work and there is a gap in the schedule for when Caroline is on holiday:

Resource Name	Details	04 Jan '10							11 Jan '10		
Unassigned	Work	S	M	T	W	T	F	S	S	M	T
Implement	Work										
Test	Work										
Caroline Bell	Work		8h	8h						8h	
Plan	Work		8h	8h						8h	
	Work										
	Work										
	Work										

6. Assign Caroline also to the Implement Task – note the warning indicator that tells you Caroline is over allocated. Right click the indicator and choose to Fix in Task Inspector to see the suggested repair options. Also look at the Resource Usage view and note Caroline's name is coloured red.
7. Remove Caroline from both the tasks – select the tasks, select Caroline's name in the Assign Resources dialog box and click Remove. Notice that both tasks are now planned to finish on 15 Jan because there are no scheduling restrictions.
8. Change the Task Mode for the Plan task to Manually Scheduled:

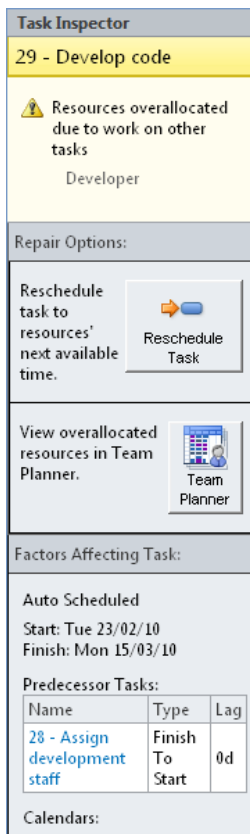


9. Assign Caroline to the task – notice this time that the finish date does not change – look at the Resource Usage view – note that there is a gap in the schedule but the difference is that project has allocated 56 hours of work (7 working days) and assumed the other three days are not required.

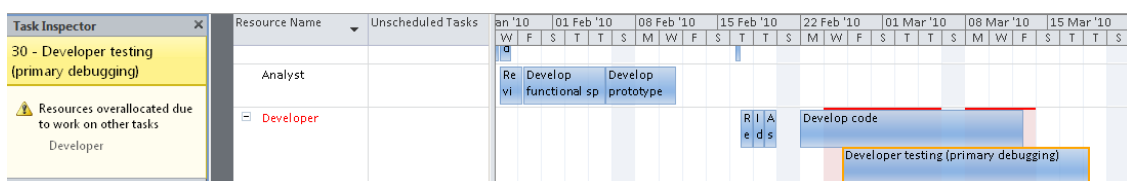
10. Close the file without saving the changes

Exercise: Using the Task Inspector and Team Planner to view and change assigned resources

1. Open the project called **3 - Software Development pre_tracking.mpp**
2. Note that the planned finished date for the project is 19 May
3. Note that some of the task (ID 29, 30, 33, 34 etc) have the warning indicator that resources are over allocated.
4. Click task 29 and click the Task Inspector command on the Task toolbar



5. This is an improved version of the Task Driver feature that was available in Project 2007 and in the task pane that appears on the left side of the screen you will see a lot of information about the selected task.
6. The Task Inspector has suggestions on how to solve the over allocation - click the Repair Option to view the **Team Planner**.
7. The Team Planner is a new view in Project that helps you view and manage your resources. You can see that the problem in this instance is that the Developer is allocated to two tasks in the same time period:

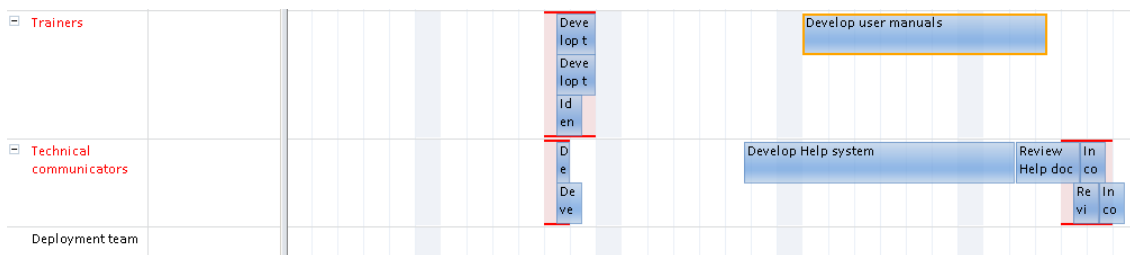


8. You can solve this over allocation by moving out the testing task until the Developer is next available - but of course will have an impact on the project dates. Click the Developer testing task in the diagram and from the Task

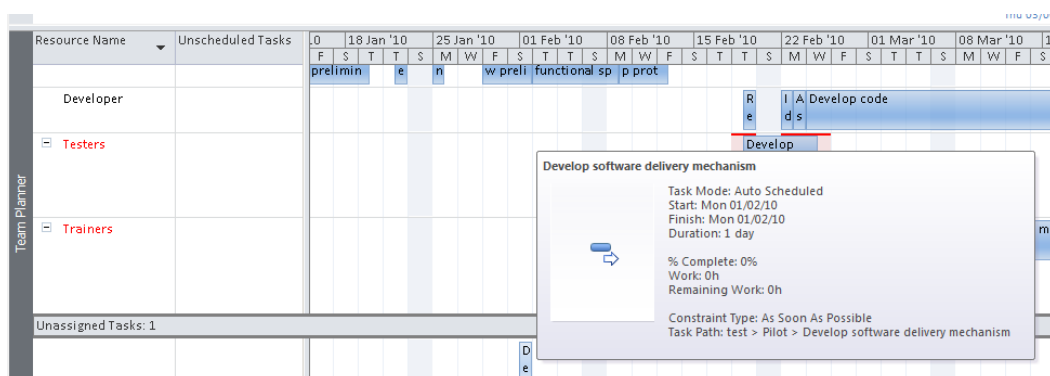
Inspector click the option to **Reschedule Task** (In the Gantt Chart you will see that the impact of this is that the project finish date has now slipped to 3 June.)

9. Note that more of your team (Testers, Trainers, Technical Communicators) are coloured red – indicating that they are also over allocated.

Another way to solve an over allocation is to assign the work to a different resource and this is quite easy to do in the Team Planner view – click and drag the Develop user manuals task so that it is reallocated to Trainers to start on 8 March:

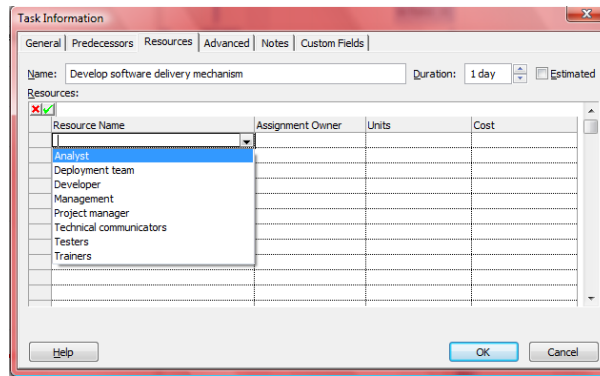


10. Note that more there is one task in your project that has not yet been assigned
(it is at the bottom of the list):



This task has not been allocated

11. Double click the task to display the Task Information dialog box
12. On the Resource tab, click the drop down arrow and select the Project Manager:



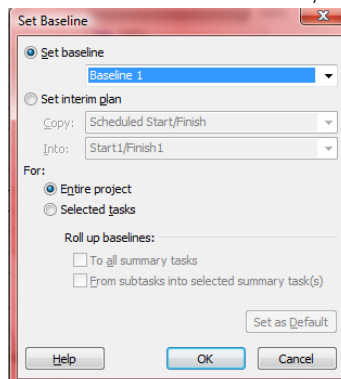
13. When you click OK you will notice that task has moved to the Project Manager's part of the diagram.
14. Switch to the Gantt Chart view by click the first view button on the bottom right of the status bar (**Tip:** Team Planner is the third view button)



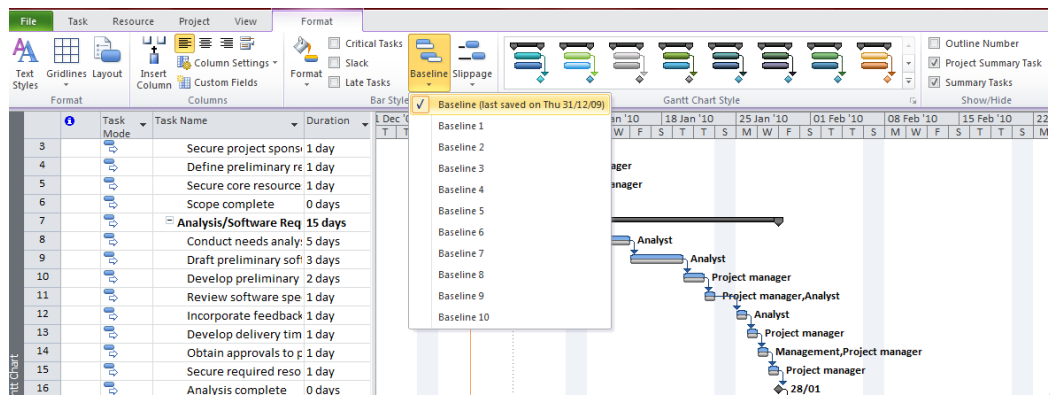
15. Close the Task Inspector pane if it is still visible

Baselining your project

1. Now that you have adjusted your plan, you decide to save the baseline so that you have a way of tracking and comparing any further changes with this current plan.
2. On the project tab, click Baseline and choose Save baseline to display the Set Baseline dialog box your project.
3. As the project has not been baselined before, simply click OK.



4. To see the baseline on the Gantt Chart, click the Format tab and choose Baseline:



5. Exit Project – when prompted save your changes.

Quick Reference Guide

Durations:

Default is entered in days

0 (zero) = milestone

? = estimated

e = elapsed (i.e. two elapsed days = 2ed = 48 hours rather than 16 work hours)

Lag/Lead:

Lag moves a task to the right; Lead to the left

May be entered as time (i.e. 4h, 3d) or as a percentage of the predecessor (i.e. 20%)

Lag entered as positive; Lead as negative

To enter lag/lead time, double-click the second task → Predecessors tab → Lag Column

To setup/change project information:

To insert tasks:

To edit tasks:

To delete tasks:

To indent tasks:

To show Project Summary Task (task 0):

To view different outline levels:

To link tasks:

To zoom in/out:

To change task relationships:

To change Lag/Lead:

To add a time constraint:

To create a new calendar:

Calendar

To assign a calendar to a resource:

To assign a calendar to a project:

To assign a calendar to a view:

To create resources:

To assign resources:

To view/change a resource's calendar:
Time

To view tables (cost, summary, tracking):

To view reports:

To view visual reports

To resolve time conflicts:

To view resource over-allocation:

To view next over-allocation:

To resolve resource conflicts:

To set baseline:

To clear baseline:

To view Critical Path:

To update tasks

To manually schedule tasks

To auto schedule tasks

To inspect tasks

To move tasks

To view timeline

To add a selected task to the timeline

To share resources from a pool file

Resources

To add projects to a master project

To work with team planner

To work with highlighting

To filter

To group

File → Info → Project Information → Advanced Properties

Task Ribbon → Insert → Task → r/click task → Insert Task

Double Click Task → Edit entry → Click OK

Click the task number and press the Delete key

Click the indent button  or drag the selected task to right

Gantt Chart Tools → Format → Show/Hide → Tick Middle box

View Ribbon → Data → Outline → Select appropriate level

Select tasks → Task → Schedule → Link Tasks button 

View Ribbon → Zoom → Zoom In/Zoom Out buttons  

Double-click the successor task → Predecessors tab → Type

Double-click the successor task → Predecessors tab → Lag

Double-click the task → Advanced tab → Constraint Type → Date

Project → Properties → Change Working Time → Create New

View Ribbon → Resource Sheet → Base Calendar Column

Project Ribbon → Properties → Project Information

Right Click Gantt Chart → Non-working Time → Calendar

View Ribbon → Resource Sheet

Resource Ribbon → Assign Resources or

Double-click the task → Resources tab or

Window → Split

Double-click resource in Resource Sheet → Change Working

View Ribbon → Data → Table

Project Ribbon → Reports → Reports

Project Ribbon → Reports → Visual Reports

Add more resources → reduce duration

View Ribbon → Resource Usage

Alt+ F5

Resource Ribbon → Level → Choose appropriate action

Project Ribbon → Schedule → Set Baseline → Set Baseline

Project Ribbon → Schedule → Set Baseline → Clear Baseline

Gantt Chart Tools → Format → Bar Styles → Select Critical Tasks

Task Ribbon → Schedule → Use % or → Mark on Track

Task Ribbon → Tasks → Manually schedule

Task Ribbon → Tasks → Auto schedule

Task Ribbon → Tasks → Inspect

Task Ribbon → Tasks → Move

View Ribbon → Split View → Select Timeline

Task Ribbon → Properties → Add to Timeline

Resource Ribbon → Assignments → Resource Pool → Share

Project Ribbon → Insert → Subproject

View Ribbon → Resource Views → Team Planner

View Ribbon → Data → Highlight

View Ribbon → Data → Filter

View Ribbon → Data → Group By

Module 5: Managing Project and project views

Objectives

At the end of this module you will have

- Reviewed how to create a project and solve resource allocation issues
- Understood what the Critical Path is and how to apply it
- Customised the Gantt Chart with various formatting options
- Understood how to use the Network Diagram view
- Learned how to insert columns and create custom tables
- Filtered the project for specific information
- Understood how to display and customise WBS Codes

Exercise: Preparing a project for analysis and tracking

To test your knowledge of Microsoft Project and to revise your knowledge at introductory level, this module, together with your instructor, will help you create a suitable project for analysis.

Alternatively, you can pick up the exercise on page 96, where you have to do some levelling and modifying to get the project on track. To do this, go to page 96 of this manual and open the data file supplied with this course named **4 - Holiday Home Levelling** in the course data folder.

1. Create a new project, name it Holiday Home with the start date of **6 Sept**
2. Making sure the project is in Auto Schedule mode, type in the following tasks, durations and notes:

Task Name	Duration	Notes
Travel to France	2d?	Drive to Portsmouth; Ferry to Cherbourg; Drive to Carcassonne.
Start searching for plot	1d	Register with local Estate Agents and buy topographical maps.
View all available plots over time	1mo	
Make offer on suitable plot	1d	
Pay deposit for plot	1d	
Have deeds checked	0.5d	
Apply for Certificate of Urbanism	0d	
Complete application form	2h	
Take to Mairie and file	1h	
Collect Certificate of Urbanism	2h	

Apply for planning permission from Mairie	0d	
Have deeds checked	0.5d	
Have outline plans drawn up	1d	
Submit plan	0.5d	
Collect Permission Acceptance letter	2h	
Pay balance on land acquisition	0.5d	
Clear land	7d	
Install services/amenities	1d	
Connect Sewerage	1d	To be carried out by Amenity Contractor, using their own resources.
Connect Electricity	1d	
Install water pump	1d	
Design Garage	3d?	Estimated design duration.
Build double garage	3mo	No specific project plan yet
Design House	3d?	Estimated design duration.
Build House	3mo	No specific project plan yet
Design Swimming Pool	0.5d?	Estimated design duration.
Build Swimming pool	1mo	No specific project plan yet

Task Linking

Most of the tasks are linked with Finish to Task relationships – follow the logic in the Notes column and create the links (you do not have to type the notes)

Task	Predecessor	Link Type	Notes for information
2	1	F to S	We can only start searching if we have finished getting there.
3	2	F to S	We can search once we've (finished) started the search process (in this case, engaged an Estate Agent).
4	3	S to S	We don't have to finish searching for one month before we can start an offer. The offer may come at any time. The link we select at this stage is that once the search has started the offer task can start.
5	4	F to S	We can only pay the deposit if we have finished making an offer.
6	5	F to S	We can only have the deeds checked if we have paid the deposit.
7	6	F to S	We can only apply for the certificate if we have finished having the deeds checked (6).
8	6	F to S	We only complete the application form if we have finished having the deeds checked (6).
9	8	F to S	We can only take the form to the Mairie if the application form has been finished (completed)
10	9	F to S	We only collect the certificate of Urbanism if the application has been taken to the Mairie.
11	10	F to S	We can only apply for Planning Permission if we have collected the Certificate of Urbanism.
12	10	F to S	It's only worth having the final deeds (the Certificate of Urbanism) checked if we have collected the Certificate of Urbanism.
13	12	F to S	We can only start the 'Have outline plans drawn up' task if we have checked the final deeds.
14	13	F to S	We can only submit the plan if we have finished drawing them up (task 13).
15	14	F to S	We can only collect the Planning Acceptance letter if we submitted the plan (task 14).
16	15	F to S	We can only pay the balance if we have collected the Planning Acceptance letter.
17	16	F to S	We can only clear the land if we have finished the task of paying the balance.
18	17	F to S	We can only start to install amenities if we have finished the task of clearing the land.
19		No link	Will become a sub task of 18.
20		No link	Will become a sub task of 18.
21		No link	Will become a sub task of 18.
22		No link	Can take place at any time after the project has started.
23	18,22		Dependent on a design having being finished, AND that the amenities have all been installed.

24		No link	Can take place at any time after the project has started.
25	24		Dependent on a design having being finished.
26		No link	Can take place at any time after the project has started.
27	26		Dependent on a design having being finished.

Outline Tasks

Outline tasks as shown below:

Task Name
Travel to France
Start searching for plot
View all available plots over time
Make offer on suitable plot
Pay deposit for plot
Have deeds checked
<input type="checkbox"/> Apply for Certificate of Urbanism
Complete application form
Take to Mairie and file
Collect Certificate of Urbanism
<input type="checkbox"/> Apply for planning permission from Mairie
Have deeds checked
Have outline plans drawn up
Submit plan
Collect Permission Acceptance letter
Pay balance on land acquisition
Clear land
<input type="checkbox"/> Install services/amenities
Connect Sewerage
Connect Electricity
Install water pump
Design Garage
Build double garage
Design House
Build House
Design Swimming Pool
Build Swimming pool

Constraints and Deadlines

Set constraints and deadlines as shown below:

Task	Constraint type	Constraint date	Deadline
Start searching for plot	SNLT	20/9/10	NA
Make offer on suitable plot	ASAP	NA	8/10/10
Have deeds checked	FNLT	22/10/10	NA
Take to Mairie and file	SNLT	11/10/10	NA

Collect Certificate of Urbanism	ASAP	NA	21/10/10
Collect Permission Acceptance letter	ASAP	NA	15/11/10
Pay balance on land acquisition	SNLT	15/11/10	NA
Install services/amenities	ASAP	NA	19/12/10

Resources

Add Resources in the Resource sheet

(all at 100% Max. Units and all available from project start to project finish):

Resource Name	Notes	Type	Group	Std. Rate (HR)	Ovt. Rate (HR)
Bryan Hayden	Project Manager	Work	Management	£40.00/h	£60.00/h
Builder 1		Work	Building	£20.00/h	£30.00/h
Builder 2		Work	Building	£20.00/h	£0.00/h
Labourer 1		Work	Building	£15.00/h	£25.00/h
Mini Digger	Fuel and maintenance	Material	Building	£5.00	
Amenity Contractor	Has own workforce for projects.	Work	Building	£75.00/h	£0.00/h
Emma Robbins	Building Contractor	Work	Building	£50.00/h	£100.00/h
Tony Butler (Surveyor)	Surveyor	Work	Professional	£100.00/h	£200.00/h
Estate Agent		Work	Procurement	£75.00/h	£0.00/h
Excavation Contractor		Work	Building	£75.00/h	£0.00/h
Solicitor		Work	Professional	£75.00/h	£0.00/h
Architect		Work	Professional	£75.00/h	£0.00/h

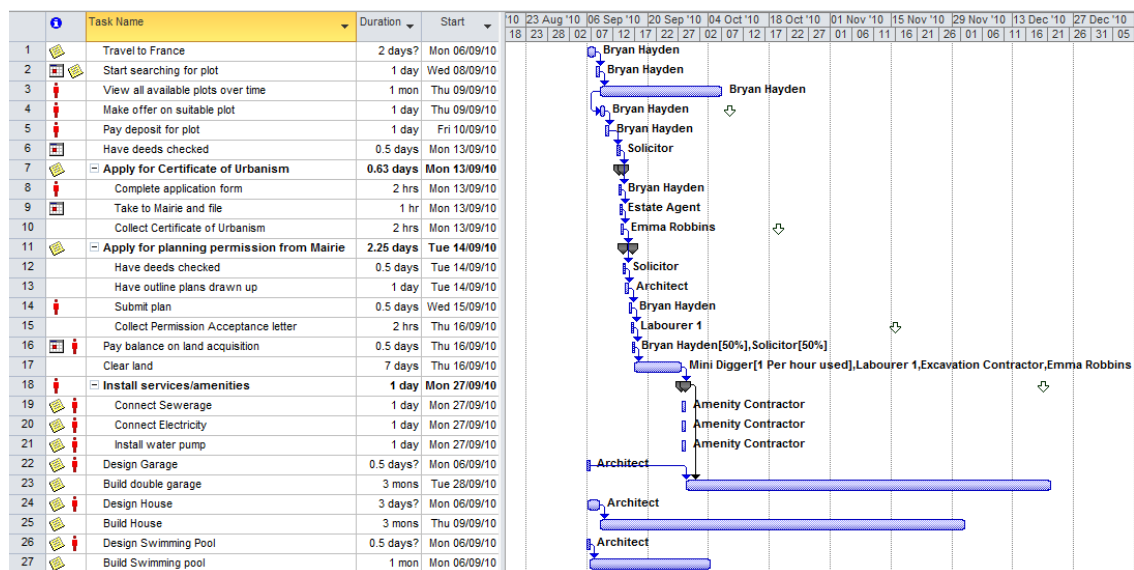
Resources Assignments

Assign resources as shown below:

Task	Resource Name	% (UNITS)	Hours forecast
Travel to France	Bryan Hayden	100%	As per duration
Start searching for plot	Bryan Hayden	100%	As per duration
View all available plots over time	Bryan Hayden	100%	As per duration
Make offer on suitable plot	Bryan Hayden	100%	As per duration
Pay deposit for plot	Bryan Hayden	100%	As per duration
Have deeds checked	Solicitor	100%	4h
Apply for Certificate of Urbanism	Summary task / Unassigned		
Complete application form	Bryan Hayden	100%	2h
Take to Mairie and file	Estate Agent	100%	1h
Collect Certificate of Urbanism	Emma Robbins	100%	2h
Apply for planning permission from Mairie	Summary task / Unassigned		

Task	Resource Name	% (UNITS)	Hours forecast
Have deeds checked	Solicitor	100%	4h
Have outline plans drawn up	Architect	100%	8h
Submit plan	Bryan Hayden	100%	4h
Collect Permission Acceptance letter	Labourer 1	100%	2h
Pay balance on land acquisition	Bryan Hayden	50%	2h
	Solicitor	50%	2h
Clear land	Mini Digger	Material accruing costs.	
	Labourer 1	100%	56hr
	Excavation Contractor	100%	28hr
	Emma Robbins	100%	56hr
Install services/amenities	Summary task / Unassigned		
Connect Sewerage	Amenity Contractor	100%	8hr
Connect Electricity	Amenity Contractor	100%	8hr
Install water pump	Amenity Contractor	100%	8hr
Design Garage	Architect	100%	4hr
Build double garage	Unassigned	NA	Unassigned
Design House	Architect	100%	24hr
Build House	Unassigned	NA	Unassigned
Design Swimming Pool	Architect	100%	4hr
Build Swimming pool	Unassigned	NA	Unassigned

Your project should look similar to the following:



Note: If you wish to pick up this exercise from here, open the file Holiday Home Levelling from the course data folder.

Exercise: Resource Levelling

Looking at the project in the **Resource Usage** view, you will see that three Resources are over allocated. This means that:

- the project schedule is incorrectly planned; and/or
- your resources really are literally over allocated; and/or
- your resources have been incorrectly set up for this project.

In fact, in this project all these factors exist and are causing the project to be incorrectly represented and scheduled.

	Resource Name	Work	Details	06 Sep '10			20 Sep '10				04 Oct '10			
				S	T	T	S	F	W	M	S	T		
	⊕ Unassigned	0 h	Work											
1	⚡ ⊖ Bryan Hayden	208 h	Work		8h	48h	40h	24h	24h	40h	24h			
	Travel to France	16 h	Work		8h	8h								
	Start searching for plot	8 h	Work			8h								
	View all available plots over time	160 h	Work			16h	32h	24h	24h	40h	24h			
	Make offer on suitable plot	8 h	Work			8h								
	Pay deposit for plot	8 h	Work			8h								
	Complete application form	2 h	Work				2h							
	Submit plan	4 h	Work				4h							
	Pay balance on land acquisition	2 h	Work				2h							
2	Builder 1	0 h	Work											
3	Builder 2	0 h	Work											
4	⊕ Labourer 1	58 h	Work				3h	24h	24h	7h				
5	⊕ Mini Digger	1 Per hour us	Work (l)				0.02	0.43	0.43	0.13				
6	⚡ ⊖ Amenity Contractor	32 h	Work							32h				
	Install services/amenities	8 h	Work							8h				
	Connect Sewerage	8 h	Work							8h				
	Connect Electricity	8 h	Work							8h				
	Install water pump	8 h	Work							8h				
7	⊕ Emma Robbins	58 h	Work				3h	24h	24h	7h				
8	⊕ Tony Butler (Surveyor)	0 h	Work											
9	⊕ Estate Agent	1 h	Work				1h							
10	⊕ Excavation Contractor	28 h	Work				1h	24h	3h					
11	⊕ Solicitor	10 h	Work				10h							
12	⚡ ⊖ Architect	40 h	Work		16h	16h	8h							
	Have outline plans drawn up	8 h	Work				8h							
	Design Garage	4 h	Work		4h									
	Design House	24 h	Work		8h	16h								
	Design Swimming Pool	4 h	Work		4h									

1. Check the first over allocation for **Bryan Hayden**.

In the resource usage view you can see quite clearly that there are a number of days where Bryan is working more than 8 hours a day. Either the allocation is illogical, or he is simply working too many hours, which could lead to high extra costs or work not being completed.

Analysis of the Resource Usage view will show that from 9 September Bryan is spending 8 hours per day viewing available plots. This means that if he is required to undertake another task during the day he will appear over-allocated on the system, which is clearly illogical.

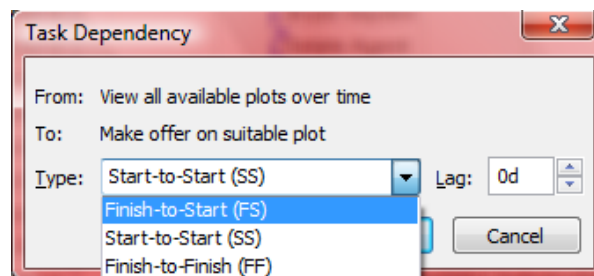
To resolve this over-allocation.

The link between tasks 3 and 4 is **Start to Start**. Whilst it is true that task 4 (make an offer on a plot) can come at any time within the one month period that has been allocated to viewing plots, it cannot take place, logically, until viewing has stopped.

One solution here is to make the link between the tasks **Finish to Start**. That is to say that, although we do not know when viewing will finish (i.e. when a suitable plot is found), it must be finished before the next task (making an offer) can start. In your own planning you might consider various other ways of restructuring the project. For example, the omission altogether of the task called 'Make an offer' and consider it as part and parcel of the Viewing task. In which case, the next task would be Pay Deposit.

This would be a partial, and logical solution. However, you would still end up with the same problem regarding a finish to start link, unless you physically moved the next task or allowed an over allocation.

For the sake of this exercise, let's assume that Bryan will stop viewing when he makes an offer. So on the Gantt Chart, double click the link line between tasks 3 and 4 and change the relationship to Finish-to-Start:



You will note that the resource, Bryan Hayden, is no longer over allocated.

2. Check the over allocation for the **Amenity Contractor**.

This resource is committed to a total of three tasks simultaneously and at 100 % availability. However, this resource is a contractor and, as per the Resource notes '**Has own workforce for projects**'.

Since this resource CAN work on three tasks simultaneously due to having his own resources and team, we can set his percentage availability to 300% - on the Resource Sheet increase the percentage and then note that this clears the over allocation of this resource.

3. The third over allocation is the **Architect**.

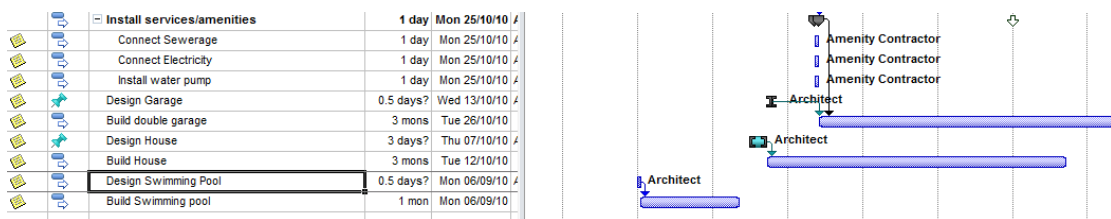
Checking the logic of the tasks on the Gantt Chart - it makes sense that:

- Build Double Garage is dependent on the finished tasks of: Design Double Garage and the Installation of Amenities
- Build House is dependent on Design House.
- Build Swimming Pool is dependent on Swimming Pool.

The problem is the lack of resources – since we only have one architect, he/she cannot work 100% on three different tasks simultaneously and therefore we need to change the sequence of the tasks.

- In the Gantt Chart, change the Design Garage Task to Manually Scheduled and type a start date of 13 Oct
- Change the Design House Task to Manually Scheduled and drag the Gantt bar to the right to fit when the architect is available (this is the same as typing in a date)

This should solve the over allocation problem and your project should look similar to the following will all resources 'levelled':



Customising the Gantt Chart

The Gantt Chart is a horizontal bar chart that represents each task in the time scale of the project. Each task entered in the project will be shown and by default the name of the resource allocated to the task appears next to the bars.

Gantt Charts form the significant part of a regular communication about your project and can be quickly formatted to display the critical tasks, the current progress, comparison with the original plan, and the new projected completion.

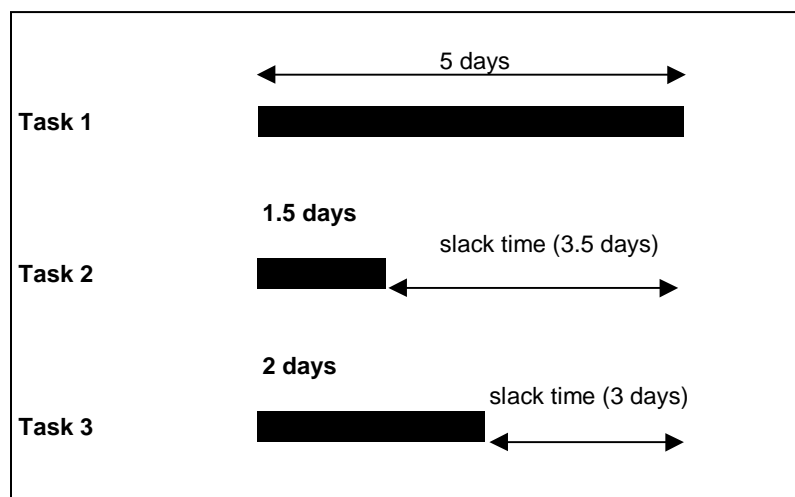
Critical Path

Critical Path Analysis or **CPA** is an important part of project management. It will enable you to interrogate the tasks in your project to see which tasks form the basis of a successful completion of the project. These tasks, should they be delayed or indeed, completed sooner than planned will have a critical and fundamental impact on your project. We need to be able to view these statistics from time to time and it will enable us, by viewing them, to either shorten the plan or concentrate on costs.

When you use Auto Schedule mode, Project schedules the tasks based on the project start or finish date and any task relationships you have defined. Using the scheduled start and finish dates, Project determines which tasks **must finish on time for the project to finish on time**.

Because other tasks are linked to the critical tasks, if a critical task finishes late, it causes all of the tasks that follow, to start and finish late. By extension, the project finishes late. Conversely, if a critical task finishes early, the project can finish early.

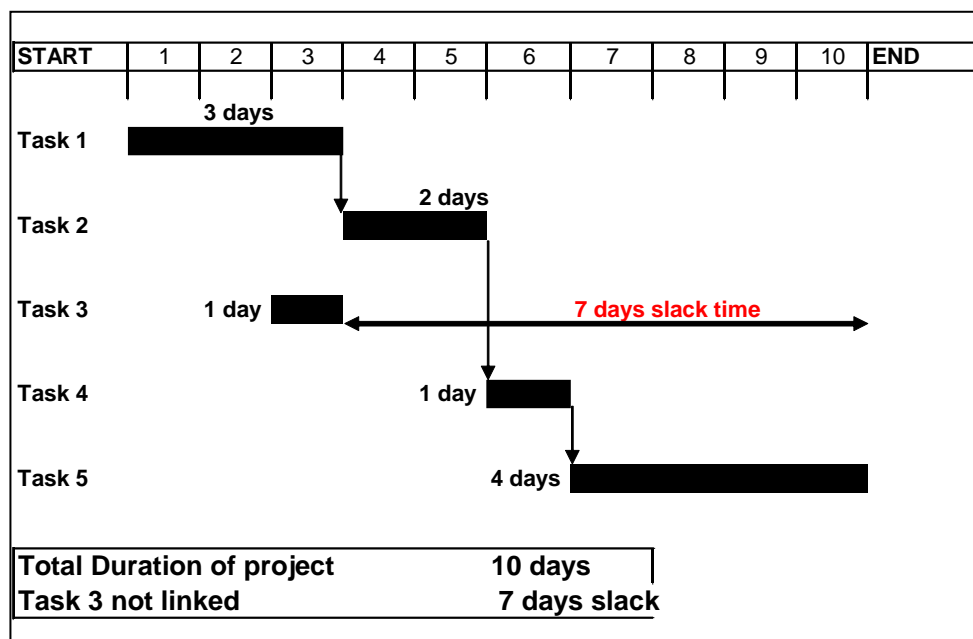
In the example below we have three tasks that are all due to start on the same day and each has varying durations:



Task 1 is the longest task; Tasks 2 and 3 are **not** linked to Task 1, which has the longest duration. So long as they are completed **prior** to the end of Task 1 the project will not overrun.

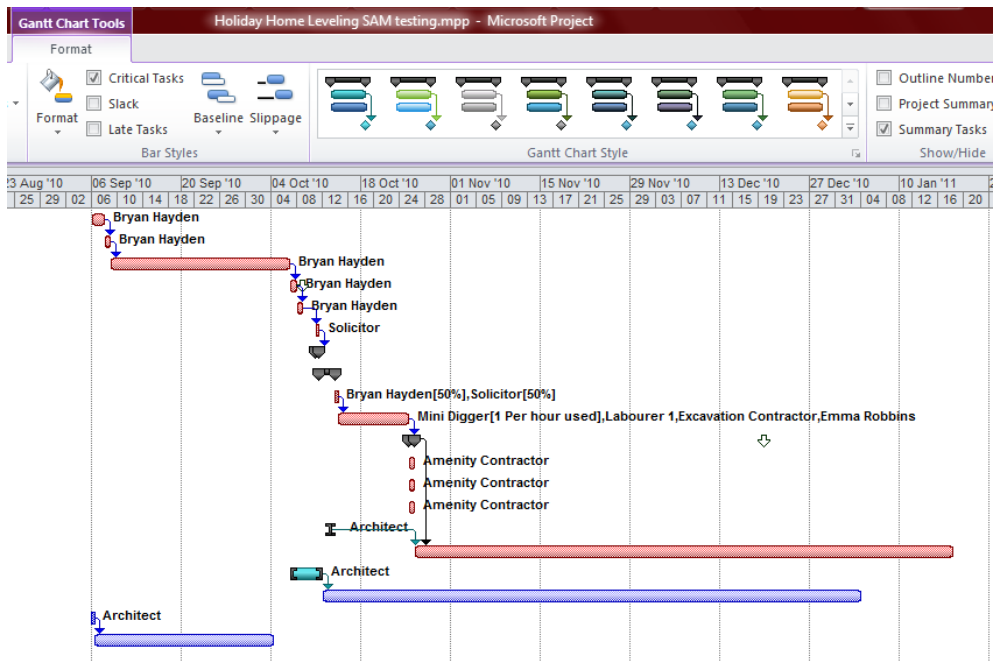
In most projects, you have many tasks linked to one another with numerous relationships. If you link all the tasks with only Finish-to-Start relationships, all of the tasks are critical. The start of one task depends on the completion of the previous task. So, all of the tasks must start and finish on time without the project going astray.

If, however, you have assigned other types of relationships in your project, some of your tasks will be **non-critical** tasks:



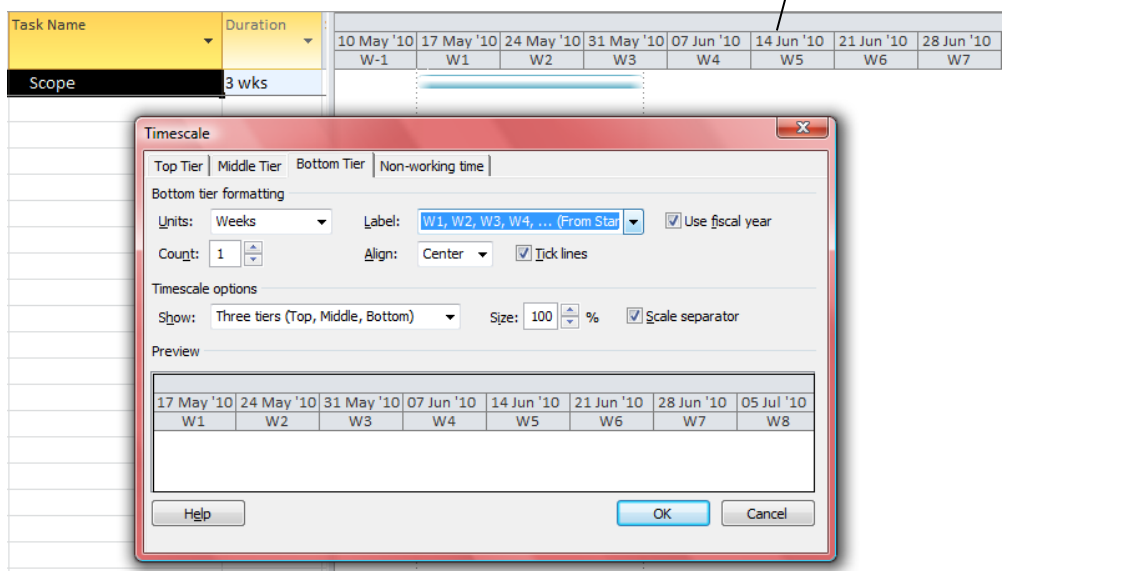
To view the critical path in the Gantt view

On the Format tab of the ribbon, click the Critical Path check box:



Changing Time Scale

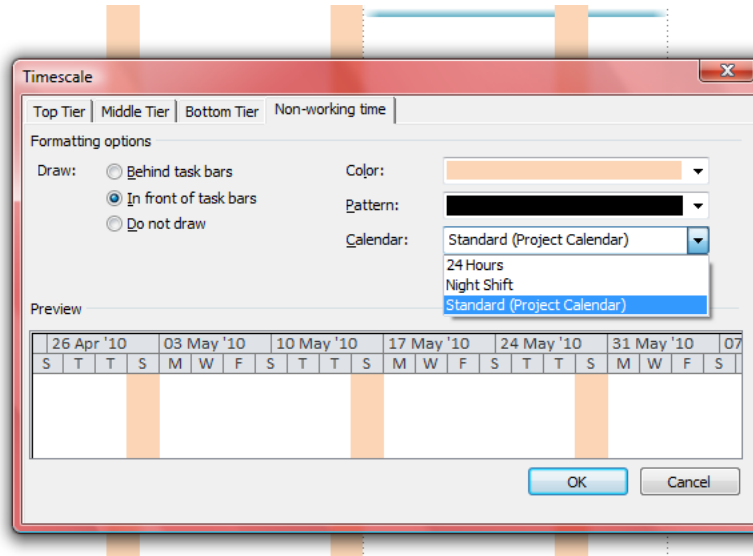
The time scale of the Gantt Chart is change by using the **Zoom Slider** on the Status bar, but you can also use the Timescale dialog box to customise the way the Timescale is displayed:



In the Timescale dialog box you can choose to display up to three tiers (Top, Middle and Bottom) and within each of these it is possible to alter the units, the label and the count of the interval.

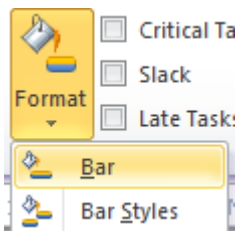
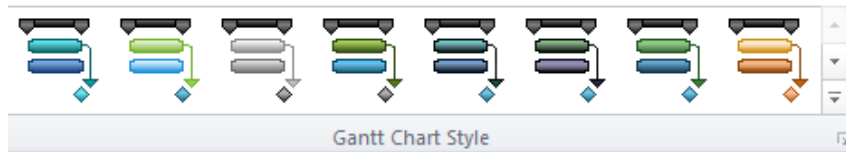
Formatting the non-working time

On the Non-working Time tab of the Timescale dialog box you can change the colour of the non-working time and whether it is displayed behind or in front of tasks. You can also choose which Calendar is displayed on the Gantt Chart:



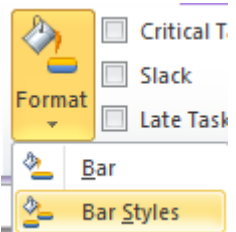
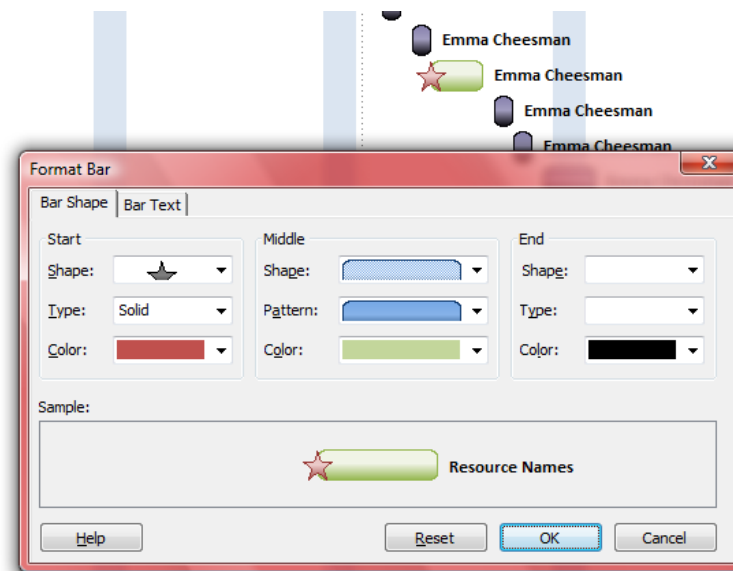
Using the Formatting Tab of the ribbon

To quickly apply different colours to the Gantt Chart bars, choose a different Gantt Chart Style:



To manually change the look on one Gantt bar:

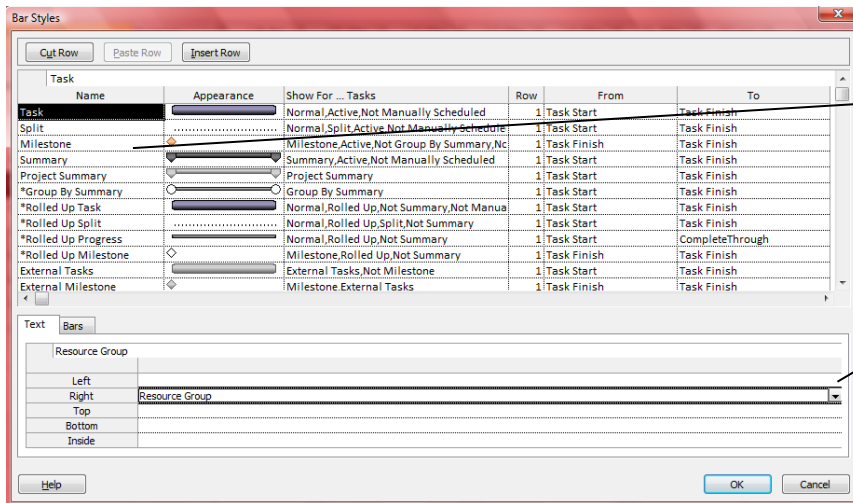
1. Select the task
2. Click the format command
3. Click bar
4. Select the required colours and shapes in the dialog box:



Use the **Bar Styles** command to manually change the display of the different types of tasks (for example, you might display the planned and actual times for each task, in different colours).

1. Select the type of task you want to change, for example Milestones
2. Chose the required colour and shape
3. Click OK

Use the Text tab of the Bar Styles dialog box to change what information is displayed next to the bars on the Gantt Chart:



Select the type of task you want to change

Click the drop down lists to change the type of data that is displayed

Add a new (custom) Gantt Bar

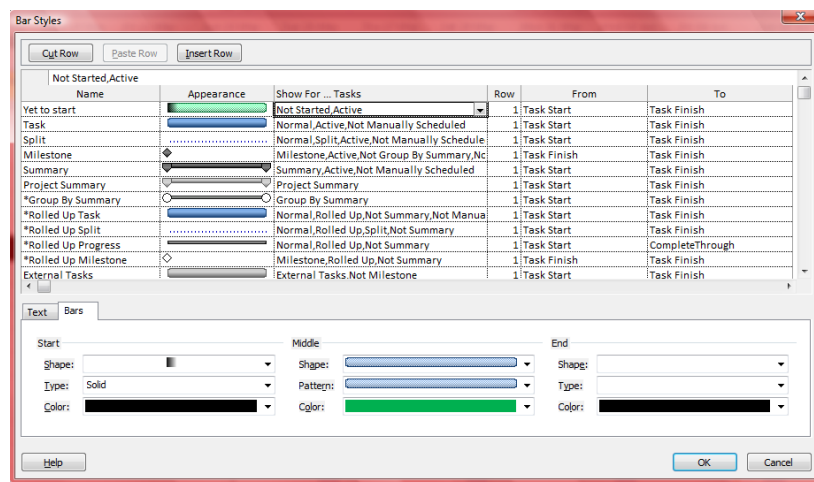
If you want to spotlight a particular task **category** that is not represented by its own Gantt bar, you can create a new Gantt bar. For example, you can create a Gantt bar to show available slack or to call attention to delayed tasks.

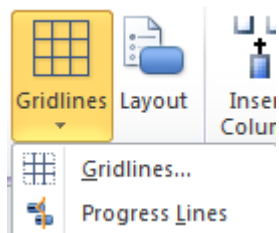
1. On the **Format** tab, click **Format** and select **Bar Styles**.
2. In the Gantt bar list, click the **Insert Row** button.
3. In the Name column of the new row, type a name for the new bar style.
Example below – 'Yet to start'.
4. In the Show For Tasks column of the new row, type or select the task type you want the bar to represent. Example below – Not Started.

To exclude tasks with a specific bar type, type not before the task type. For example, you can define a bar type as not milestone to display only tasks that are not milestone tasks.

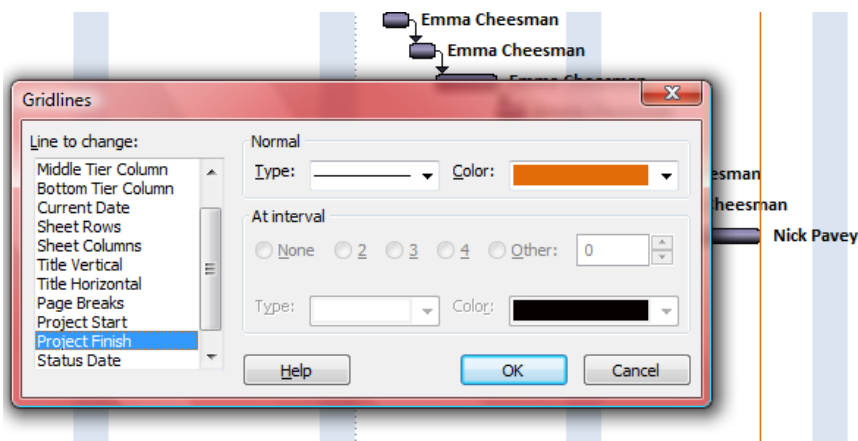
To display a Gantt bar for tasks of multiple types (such as tasks that are milestones and critical), type a comma (,) after the task category in the text entry box, and type or select a second task category.

1. In the From and To columns, type or select the fields you want to use to position the start and finish points of the new Gantt bar. For example, to create a symbol that represents a single date, type or select the same field in the From and To columns.
2. Click the **Bars** tab, and then under **Start**, **Middle**, and **End**, select shapes, patterns or types, and colours for the bar.
3. Click the **Text** tab and choose the type of information you want to print next to your new Gantt bar
4. Click **OK**.



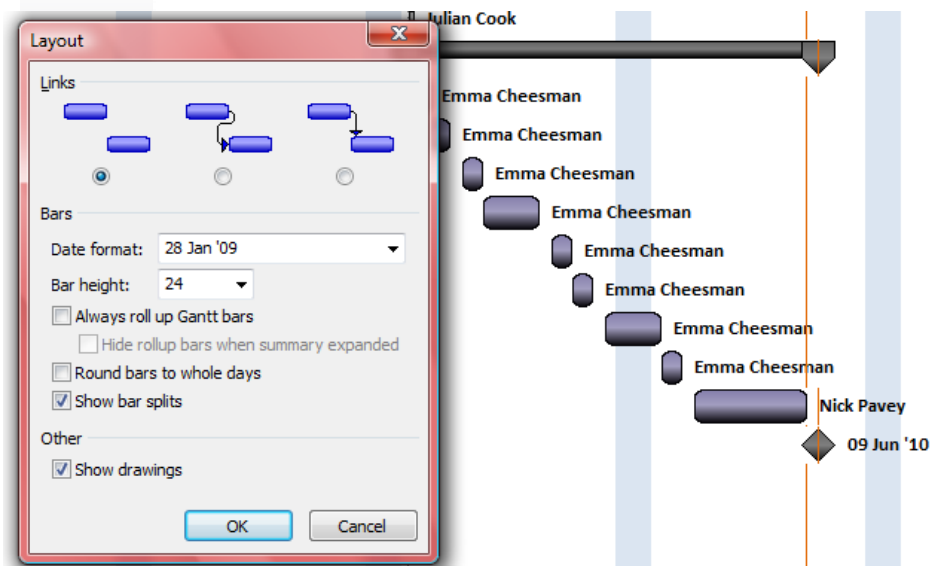


Click the Gridlines command and choose Gridlines to display the Gridline dialog box. You can change the display of the vertical lines for the current date and project finish date line, etc:



Click the Layout command to display the Layout dialog box where you can change how Links are displayed as well as the bar height, etc:

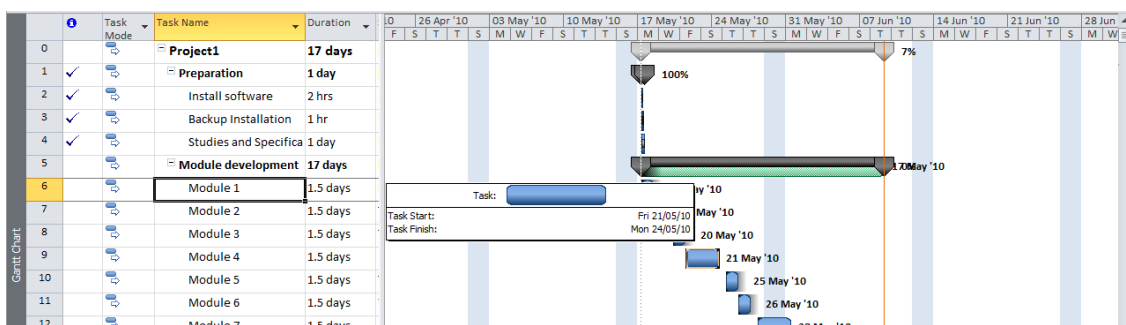
Layout



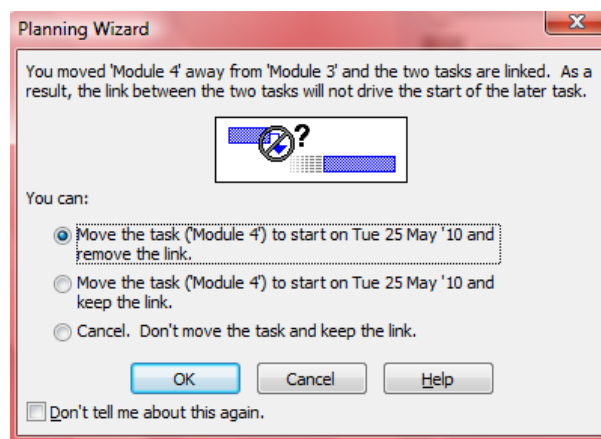
Editing Tasks using the Gantt Chart

One method of editing tasks is to change them on the Gantt Chart using the mouse and dragging:

1. Positioning the pointer at the beginning of a bar will change the pointer to a % sign and dragging with the mouse to the left will update the percentage complete of the task.
2. If the pointer is placed in the centre of the bar it will change to a four-way arrow pointer. It is then possible to drag the bar to the left or right. A label will appear informing you of what you are doing:



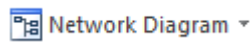
If you change a date that then causes a conflict, the Planning Wizard dialog box will alert you of the problem:



3. The duration of the task can be changed by changing the length of the bar. If the pointer is positioned at the right end of the bar it will change into a right pointing arrow. You can then drag to change the length of the bar.

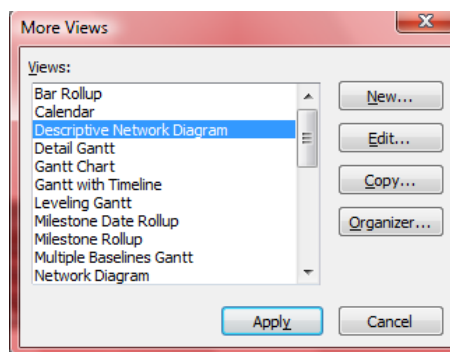
Using Network Diagrams

To see the Network Diagram, on the View tab of the Ribbon click Network Diagram



Note: The Descriptive Network Diagram view is identical to the Network Diagram view, except for the size, and the detail of the boxes that represent tasks. The boxes on the Descriptive Network Diagram view are larger and can contain labels for the data elements in the box. These larger boxes take up more space, and thus fewer boxes fit on a printed page.

To display the Descriptive Network Diagram view, click the Other Views command on the View tab, select More Views and then select the Descriptive Network Diagram:



Network Diagrams (the PERT Chart principle)

The term PERT is derived from Programme Evaluation and Review Technique which was invented for the management of Projects by paper based systems. The NETWORK DIAGRAM which has evolved from the PERT Chart is a diagrammatic view of the tasks where the position of the task and the lines linking them together represent the detailed steps that comprise the project. The Network Diagram view displays tasks and task dependencies in a network or flowchart format. A box (sometimes called a node) represents each task, and a line connecting two boxes represents the dependency between the two tasks.

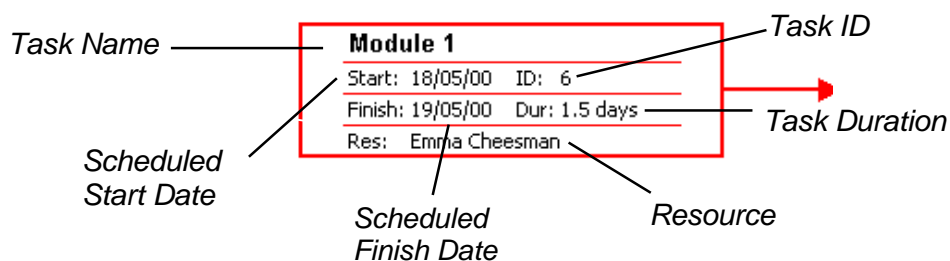
It is possible to create a new project in the Network diagram or modify an existing project by adding and linking tasks.

- To create a new task, in an empty part of the Network diagram drag a rectangle shape with your mouse – a new node will appear ready for you to type in the details

- To create a new task that is linked to an existing task, click the existing task and drag with your mouse to an empty part of the diagram — a new node will appear ready for you to type in the details.

The Network Box (or Node)

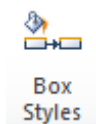
A Network box consists of five fields, as illustrated below. The Task Name, Task ID, Scheduled Start Date, Scheduled Finished Date, and Task Duration are the default fields in the Network box. The Task Name field is white because it is currently ready for user input.

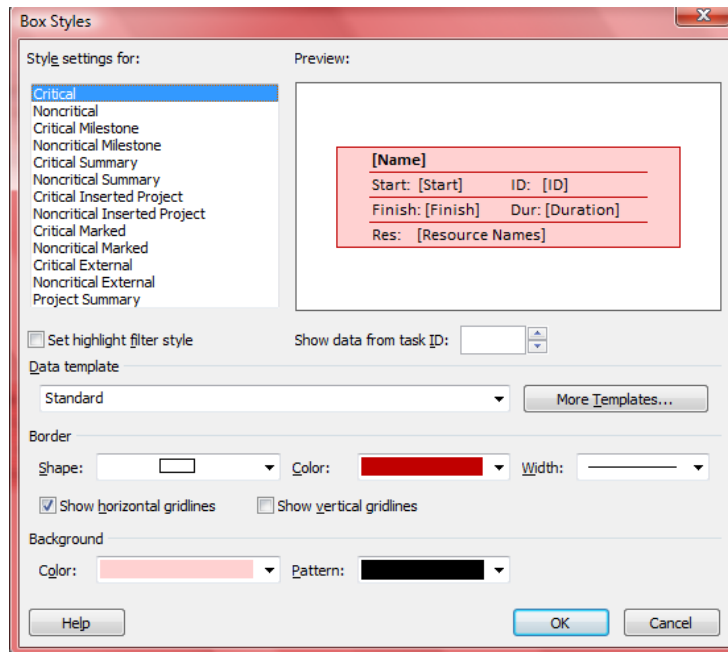


Change how the nodes are displayed

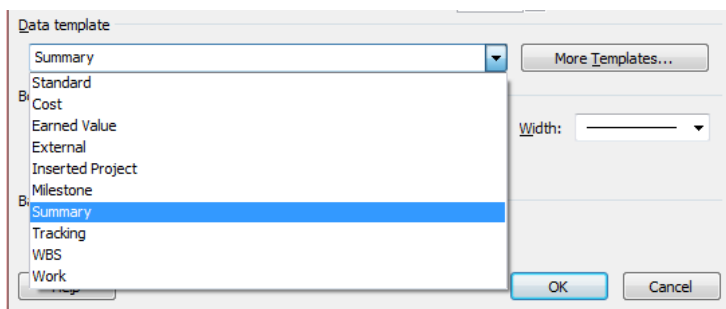
Note: By default, the network diagram shows critical tasks in red and displays one diagonal line through a task that is in progress and crossed diagonal lines through a completed task.

On the Format tab, click Box Styles.





1. In the Style settings for list, click the task category whose content and appearance you want to change.
2. Choose a different Data template – which changes what data is displayed on the node:



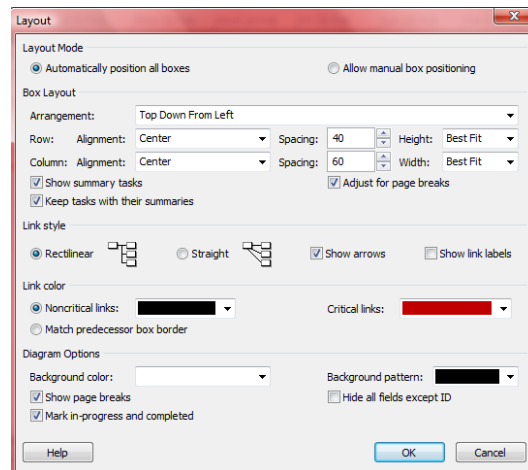
3. Under Border, choose the shape, colour, width, and gridline options to create the look you want.
4. Under Background, choose the required colour and pattern.
5. Click OK

Adjust the diagram layout

Depending on the structure of your project, the number of summary tasks and subtasks and the number and types of task links, the Network Diagram boxes may not be arranged as you expected. You can modify the layout by applying different box arrangements, adjusting various layout parameters, and applying one of two different link styles:

On the Format tab, click Layout.

1. Under Box Layout, in the Arrangement list, click how you want the boxes to be arranged.
2. For rows and columns, specify alignment, spacing, height, and width in the corresponding boxes.
3. To space boxes evenly, click Fixed in the Height and Width boxes.



Note: If you can't arrange Network Diagram boxes the way you want, you may want to position them manually: Click Allow manual box positioning, click OK, and then drag the boxes to the location you want.

Change the link line style

If you have many tasks that are linked to a predecessor or task, the link lines can overlap and be difficult to read in the Network Diagram view. You can change the style of the link lines and arrange them how you want. You can also display task dependency labels on the link lines.

On the Format tab, click Layout:

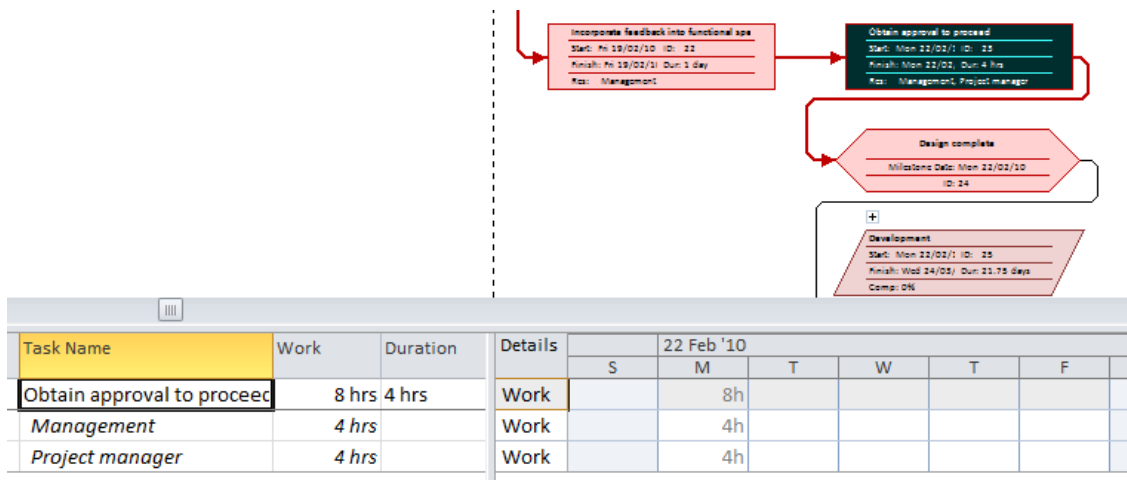
- To display link lines as straight lines between predecessor and successor task boxes, under Link style, click Straight.
- To display link lines as horizontal and vertical line segments connected at right angles between predecessor and successor task boxes, under Link style, click Rectilinear.
- To display labels on link lines identifying the task dependency and any lead or lag time under Link style, select the Show link labels check box.
- To display link lines with arrows indicating the predecessor and successor of tasks, under Link style, select the Show arrows check box.

The Network Diagram in a combination view

A combination view contains two views. The view in the bottom pane shows detailed information about the tasks or resources you select in the view in the top

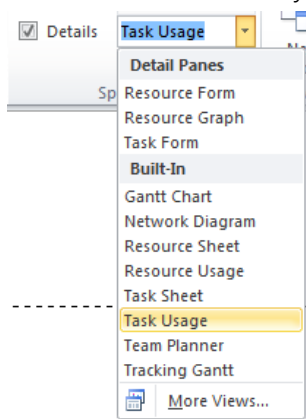
pane. For example, you can have the Gantt Chart view in the top pane and the Task Form view in the bottom pane. When you select a task in the upper view, the Task Form view displays detailed information about that task. The same applies to Network Diagrams.

In the illustration below the selected task is shown in detail in the lower pane where the Task Usage view is displayed:



To split the screen

1. On the View tab of the ribbon check the Details box
2. Click the drop down arrow to choose the Detail you wish to display.



Note: to remove the split, uncheck the Details box.

Navigating the Network Diagram

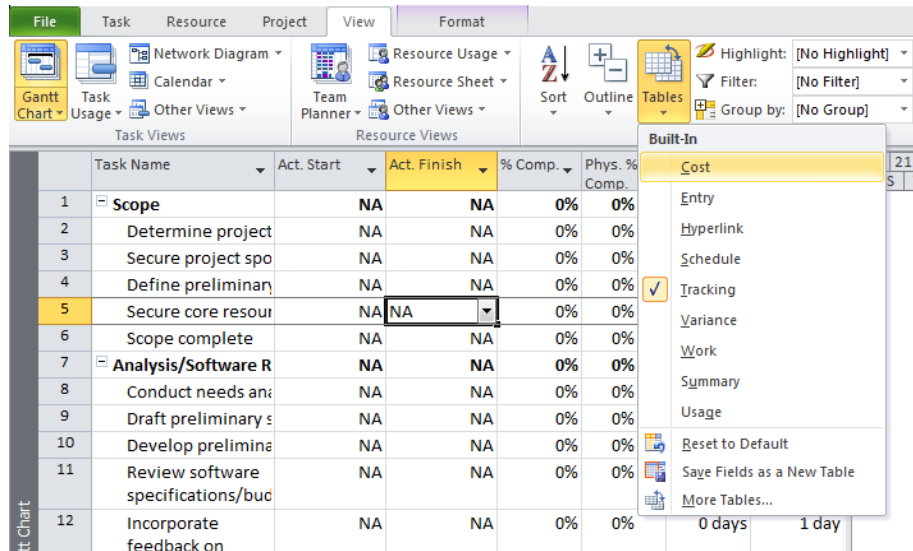
The table below summarises how to move around the Network Diagram with your keyboard and with your mouse.

Movement	Keys	Mouse
To a different NETWORK box	Arrow keys	Click the NETWORK box
Next field in NETWORK box	TAB or ENTER	Click the field
Previous field in NETWORK box	SHIFT+TAB or SHIFT+ENTER	Click the field
Page up or page down	PAGE UP or PAGE DOWN	On the vertical scroll bar, click the gray area above or below the scroll box
Page to the left or right	CTRL+PAGE UP or CTRL+PAGE DOWN	On the horizontal scroll bar, click the gray area on the left or right of the scroll box to scroll left or right in increments
To upper-left NETWORK box in project	HOME	
To lower-right NETWORK box in project	END	
To upper-left NETWORK box on screen	CTRL+HOME	
To lower-right NETWORK box on screen	CTRL+END	

More about Tables

Much of the data the system holds can be entered and/or viewed in a table format.

Project has predefined sets of columns (called tables) which display specific information. To apply a different table to a sheet view, click the View tab, click Tables, and then select the table you want to apply:

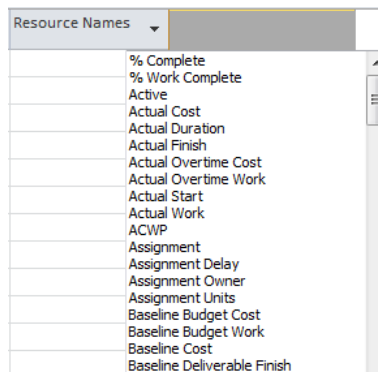


Inserting columns

It is possible to add/remove columns from any of the tables, for example if you widen the divider bar on the Gantt Chart you will see that the last column is set to Add New Column:

Resource Names	Add New Column

Click **Add New Column** to see a list of possible columns you can insert:



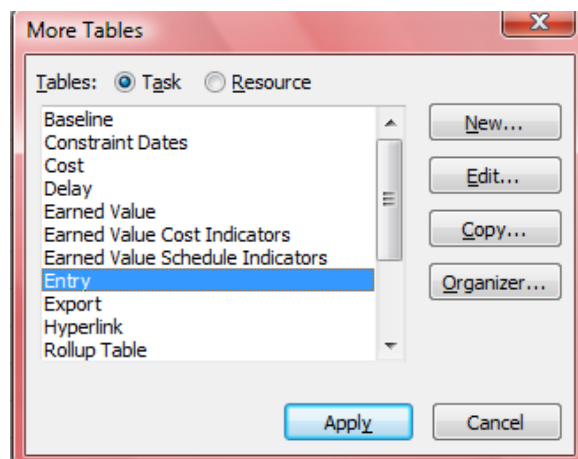
Tip: You can also right click any existing column heading and choose to Insert a Column.

Remove (hide) columns

- Click the column heading and press delete on the keyboard – you will never delete the column, you are simply hiding it from the view.
- Click undo to immediately undo this action – or insert the column using the steps above.

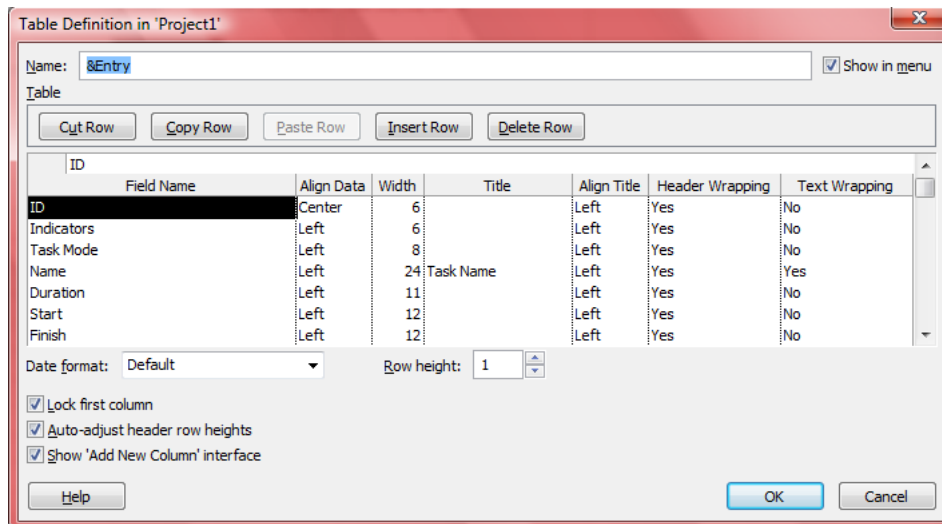
Modifying (or editing) an existing Table using the Table Definition Dialog Box

On the View tab of the Ribbon, select Tables – More tables:



Select from this list the one you want to change/modify and click Edit.

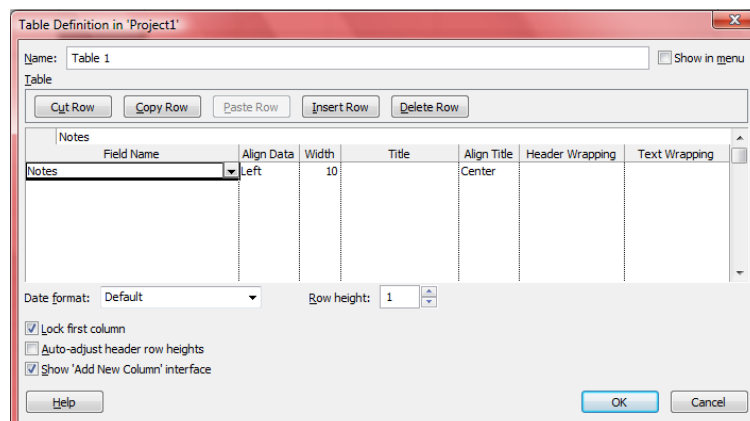
The **Table Definition** dialog box shows a list of the fields (columns) that make up the table. It is possible to change the width of an existing column, the alignment, or the column title as well as inserting and deleting columns:



- Position the pointer at the required position and click the **Insert [Row/Column]** button. A space will appear and the new field can be selected from the drop down list
- To remove a field, point to it and press the **Delete** button.

Creating a New Table

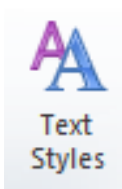
New Tables can be created by selecting the **New** button from the **More Tables** dialog box.



The structure of the table is built up by selecting the fields in the appropriate order.

Tip: Check the box **Show in menu** so that it is easy to apply your new table.

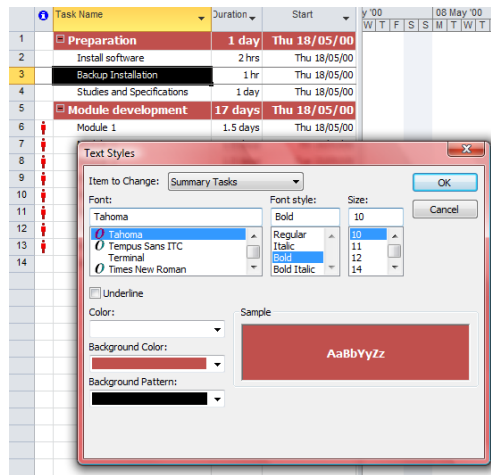
Formatting tables



Click the Text Styles command to display the Text Styles dialog box

1. From the Item to Change drop down list choose the item (for example Summary Tasks)

2. Choose the required Font, Size, Color, etc
3. Click OK

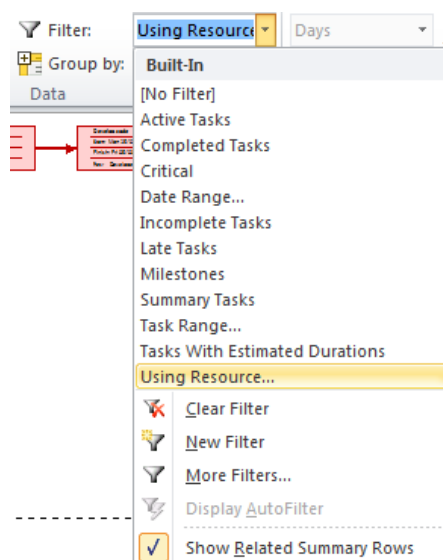


Applying Filters

A filter is used to screen out unwanted tasks for a particular view to identify a particular aspect of the current state of the project, for example the filter can be set to show the tasks that make up the Critical Path.

As with tables there are different filters for tasks and resources and depending on the current view the appropriate list of filters will be shown for the selection.

1. Select the view you want to filter (eg Gantt Chart, Resource Sheet, etc)
2. Select the View tab of the Ribbon
3. Click the drop down arrow of the Filter command and choose the required Filter



4. Remove the filter by choosing [No Filter]

Using AutoFilters

In addition to standard filters Project provides AutoFilters, visible in any sheet view where each column in a sheet view has its own AutoFilter indicated by the drop down arrow on each of the column headings:

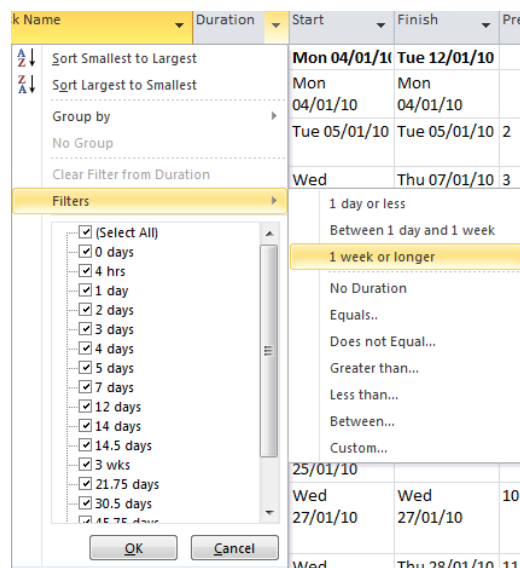
Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
-----------	-----------	----------	-------	--------	--------------	----------------

When you choose an option from the AutoFilter drop down arrows, Project displays only those tasks or resources that match the criteria - selecting an AutoFilter does not delete information from your project, but simply hides information from your view.

Let's say you're reviewing your project tasks and only want to view those tasks that take more than one week to complete:

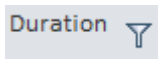
Click the AutoFilter arrow in the Duration field

1. Choose Filters – choose 1 week or longer:



Project now displays only those tasks that will take more than 1 week to complete and Notice that the column heading for the Duration field has a filter icon,

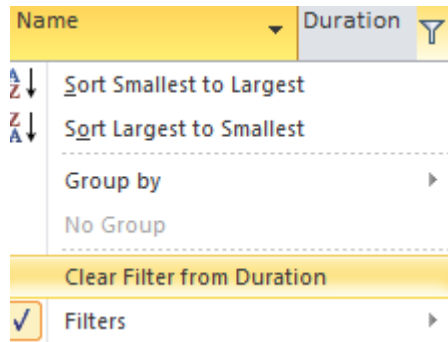
indicating that an AutoFilter is in use



By selecting AutoFilters for more than one column, you can narrow the information even further. For instance, by setting the AutoFilter for the Duration field to greater than 1 week and setting an AutoFilter in the Resource Name field for a particular

person, you can view only those tasks assigned to that person that take more than 1 week to complete.

To clear a filter, click the filter icon on the column heading and choose Clear Filter from...



AutoFilters are specific to each column, allowing you to pick from any of the data in that column. For example, when you click the **AutoFilter** arrow for the Resource Name field, you see a list of all the resources in your current project and you can multi select as many of the resources as you like.

Tip: Creating custom and interactive filters is explained in the advanced course.

Exercise: Working with Tables and Filters

1. Open the project file Software Development with baseline_trackingV2.mpp
2. From the View tab, select Other Views and select Task Sheet.
3. From the View tab, click the Tables command and examine the different tables available
4. From the View, Tables command choose More Tables
5. Select the Entry table and click Copy
6. Name this new table **myEntry** and click the option to show in menu
7. Add the Notes column and the % Complete column to the bottom of the list of fields
8. Click OK and click Apply to view the result
9. View the Resource Sheet
10. Apply the Export table
11. Examine the different built in filters (available on the View tab)
12. Examine the different AutoFilters
13. Close the project without saving the changes

WBS Codes and Viewing a WBS

What is a work breakdown structure code?

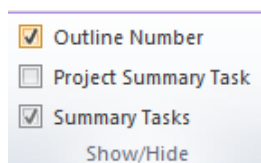
Work breakdown structure (WBS) codes are alphanumeric codes that identify each task's unique place in the outline structure of your project. There are two types of WBS codes in Microsoft Project.

1. Outline numbers. Outline numbers are the simplest type of WBS code; Microsoft Project calculates outline numbers for each task based on the outline structure of the task list. Outline numbers consist of numbers only, and you can't edit them, but they change automatically when you move a task up or down in the task list or indent or outdent tasks.

2. Custom Codes. The second type of WBS code is a custom code that you define. You can define one set of custom WBS codes per project and display it in the WBS field. Each level of the WBS code represents an outline level in the task list. But unlike outline numbers, the levels of the code can be represented as uppercase or lowercase letters, numbers, or characters (a combination of uppercase and lowercase letters and numbers), depending on which you specify for each level in the code mask when you create the WBS code. You can choose whether to automatically calculate custom WBS codes for new tasks and whether to allow duplicate WBS codes for different tasks.

Displaying outline numbers

On the Format tab of the ribbon, click the option to display outline numbers:



The numbers are displayed in the Task Name column:

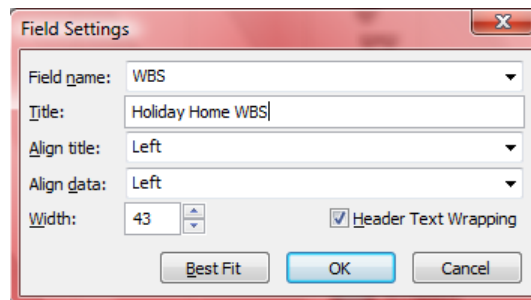
Task Name
1 Travel to France
2 Start searching for plot
3 View all available plots over time
4 Make offer on suitable plot
5 Pay deposit for plot
6 Have deeds checked
+ 7 Apply for Certificate of Urbanism
- 8 Apply for planning permission from Mairie
8.1 Have deeds checked
8.2 Have outline plans drawn up
8.3 Submit plan

Displaying the WBS column

To make working with WBS codes easy, you can add the WBS column to a sheet view. In the example below the WBS has been added to the Task sheet and given a custom name:































Right click the Task Name column heading

1. Choose WBS
2. To change the name of the column, right click the column heading and choose Field Settings where you can type your preferred column title:



The automatic WBS code is based on the task IDs and indentation level:

Project – Intro/Intermediate Reference Guide

	Task Mod	Holiday Home WBS	Task Name
		1	Travel to France
		2	Start searching for plot
		3	View all available plots over time
		4	Make offer on suitable plot
		5	Pay deposit for plot
		6	Have deeds checked
		7	± Apply for Certificate of Urbanism
		8	– Apply for planning permission from Mairie
		8.1	Have deeds checked
		8.2	Have outline plans drawn up
		8.3	Submit plan
		8.4	Collect Permission Acceptance letter
		9	Pay balance on land acquisition
		10	Clear land
		11	– Install services/amenities
		11.1	Connect Sewerage
		11.2	Connect Electricity
		11.3	Install water pump
		12	Design Garage

Why use Custom WBS Codes

The task IDs give you your basic structure of the project. The WBS codes are a further hierarchical way of organising, viewing and tracking tasks based on the WBS coding system. The WBS takes account of summary tasks as shown in the previous section. But what happens if you need to view your project's hierarchy in a certain way that is separate to the basic (chronological) order. For example, your financial department might dictate a certain hierarchical structure based on an accounting system. Or, you may wish to have a standard WBS system across a company's range of projects. A company WBS standard.

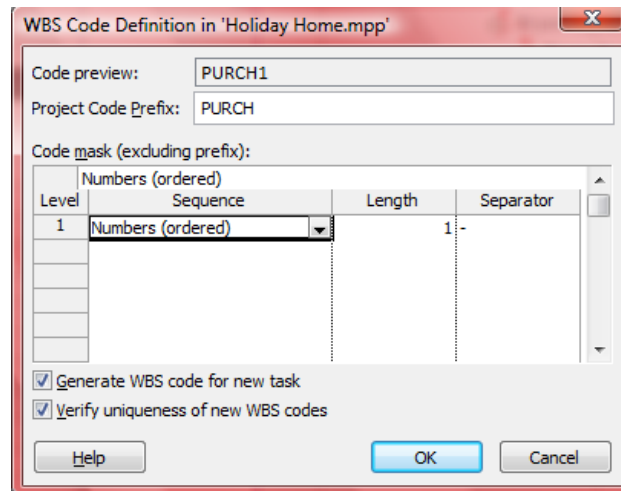
In the example below, the project has been allocated a WBS with the prefix PURCH to use as a custom WBS coding, perhaps for the accounts department, acting like a custom purchase code ordered according to task hierarchy.

WBS	Task Name
PURCH1	Travel to France
PURCH2	Start searching for plot
PURCH3	View all available plots over time
PURCH4	Make offer on suitable plot
PURCH5	Pay deposit for plot
PURCH6	Have deeds checked
PURCH7	Apply for Certificate of Urbanism
PURCH7-1	Apply for Certificate of Urbanism
PURCH7-2	Apply for Certificate of Urbanism
PURCH7-3	Collect Certificate of Urbanism
PURCH8	Apply for planning permission from Mair
PURCH8-1	Have deeds checked
PURCH8-2	Have outline plans drawn up

Create a custom WBS code

If your organisation or client requires a particular work breakdown structure (WBS) code format, you can define a sequence for each level of the WBS code by using a custom code mask. Microsoft Project uses the code mask to assign WBS codes to tasks depending on their places in the hierarchy of the project's outline:

On the Project tab, click WBS, and then click Define Code:



1. To specify a project code prefix that distinguishes the tasks in this project from tasks in other projects, type a prefix in the Project Code Prefix box.
2. **Note:** If you work with multiple projects consolidated in a master project or often have projects with links to external tasks, adding a project code prefix can help you distinguish tasks from different projects.
3. To specify the code string for first-level tasks, in the first row in the Sequence column, click the type of character you want to use for this level.
 - Click Numbers (ordered) to show a numerical WBS code for this level.
 - Click Uppercase Letters (ordered) to show uppercase alphabetical WBS codes (for example A, B, and C for the first three summary tasks in the project).
 - Click Lowercase Letters (ordered) to show lowercase alphabetical WBS codes (for example a, b, and c for the first three summary tasks in the project).
 - Click Characters (unordered) to show any combination of numbers and uppercase and lowercase letters (for example, Arch1, Const1, and Insp1 and for the first three summary tasks in the project). Choosing this option gives you the most flexibility for entering customized WBS codes. Microsoft Project displays an asterisk (*) in the WBS field until you type or enter a string of characters for this level of the WBS code.
4. In the first row of the Length column, type or select a number for the maximum number of characters in the first-level code string. For example, type 3 to make three characters the mandatory number of characters to enter in this level of the WBS code. The total length of a WBS code can be up to 255 characters.
5. In the first row of the Separator column, type or select a character to separate the code string for one level from the code string for the next level. By default, the separator character is a period.
6. To continue to specify code strings for each level, click the next row in the Sequence column and repeat steps 3–6.

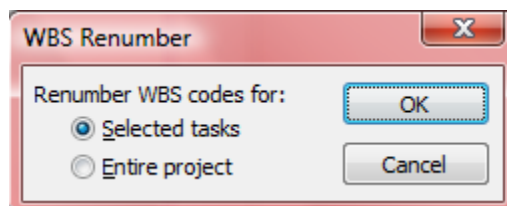
Notes:

- You can have different separator characters between each code level.
 - You can type a character other than a period, minus sign, plus sign, or slash; for example, you can type an ampersand (&) or a number sign (#).
 - If you don't want Microsoft Project to assign a WBS code each time you enter a new task, clear the Generate WBS code for new task check box.
 - If you want to use the same WBS code for different tasks, clear the Verify uniqueness of new WBS codes check box. After you create a WBS code mask, you will need to display the WBS field in your project task sheet by inserting the WBS column.
- Renumber the custom WBS codes of tasks**

If you move, delete, or rearrange tasks, you may notice that their custom WBS codes are not in the correct sequence. You can change the WBS codes one at a time, manually, or all at once if you need to update more than a few tasks.

- If you do not select any tasks or if only one task is selected, Microsoft Project corrects the custom WBS codes for the entire project. If multiple tasks are selected, the first task in the selection is not renumbered because it is used as the reference for renumbering the other tasks.
- If you have subprojects inserted within your project and want to renumber some or all tasks in the subproject, click Show, and then click All Subtasks. If a subproject's tasks are not displayed, Microsoft Project doesn't renumber them.

On the Project menu, click WBS, and then click Renumber.



11. To correct the WBS code sequence for selected adjacent tasks, click **Selected tasks**. To correct the WBS code sequence for all tasks in the project, click **Entire project**.

12. Click OK

Module 6: Examining and Updating the Project

Objectives

At the end of this module you will be able to

- Use different views to amend task information
- Understand how to set and view Baseline and Interim plans
- Track tasks and update the project
- Understand the different ways that project costs are entered and calculated

Amending tasks

As the project progresses it is important to enter updated information to indicate that tasks have been changed.

Note: If you are using Auto Scheduling mode, the system is dynamic in the sense that if a single element of a task is altered that has a bearing on other elements, the changes will be calculated and the other elements automatically updated.

MS Project has a number of different views/ways to add, delete or amend tasks:

- Task Sheet with different tables
- Task Details Form
- Using the mouse to update the Gantt Chart bars
- Network Diagram
- Resource Usage and Task Usage
- Team Planner

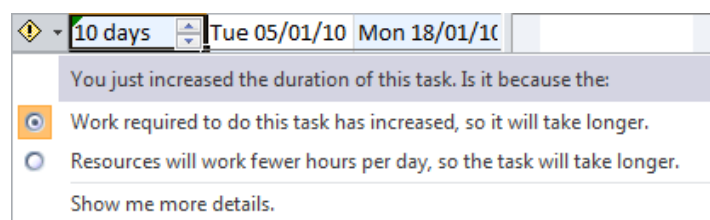
Using the Task Sheet

The **Task Sheet** is the sheet displayed on the left hand side of the Gantt Chart. You can choose to display just the Task Sheet by choosing View, Other Views, Task Sheet.

The Task Sheet is most useful for inserting/deleting tasks and creating the outline (WBS). You can also double click a task to display the Task Information Dialog Box which has options to add constraints and notes.

The default table (set of columns displayed) is the Edit Table which is a convenient view to insert/delete and link tasks. To add/amend resource assignments in this view use the Assign Resources command button (on the Resources tab of the ribbon) or split the screen.

Understanding the Smart Tag Feature



- When you are using Auto Schedule mode and you assign additional resources to a task or change the duration of a task, a green indicator and a smart tag alert you that changes have been made. Click the tag to see the available scheduling options.

- The tag is only available temporarily – as soon as you make other changes to the project the symbols disappear.

Displaying different tables

To display a different table click the View Tab and select the Tables command.

There are several built in tables that provide useful information and in particular if you are updating the tasks with the amount of work completed you should use the Tracking table which allows you to update the following:

Act. Start:	The actual date the task started.
Act. Finish:	The actual date the task was completed.
% Comp.:	If the task is started but not finished, the percentage of the work completed.
Phys. % Comp.:	The amount of 'Physical' work complete.
Act Dur.:	The actual number of time periods that have been spent so far.
Rem. Dur.:	The number of time periods left, calculated from the planned or scheduled length less the actual duration.
Act. Cost:	The value of calculated from the time periods completed and the cost of each resource assigned to the task.
Act. Work:	A measure of the work completed in hours calculated from the actual duration and units of each resource.

Using the Task Details Form

Click the View Tab, chose more views, Tasks Details Form.

Right click the form to choose an alternative display – for example Work details allows you to update the amount of planned work, overtime work, actual work completed and remaining work still to be done:

The screenshot shows the 'Task Details Form' for a task named 'Collect Certificate of Urbanism'. The task is 2 hours long, effort-driven, and has a priority of 500. The start date is Tue 24/04/01 and the finish date is Wed 25/04/01. The task type is 'Fixed Units' and the WBS code is 'PURCH7-3'. The resource table shows one resource, Emma Robbins, with 100% units and 2h of work. A right-click context menu is open over the resource table, with the 'Work' option highlighted. The menu options are: Show Split, Predecessors & Successors, Resources & Predecessors, Resources & Successors, Schedule, Work, Cost, Notes, and Objects.

ID	Resource Name	Units	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
7	Emma Robbins	100%	2h	0h	0h	0h	2h

Tip: Click the Next button to go to the next task or use the keyboard shortcut Ctrl F to display the Find dialog box and use this to search for specific tasks:

The screenshot shows the 'Find' dialog box. The 'Find what' field contains the text 'deeds'. The 'Look in field' is set to 'Selected' and the 'Name' field is selected. The 'Test' is set to 'contains'. The 'Search' direction is 'Down'. The 'Match case' checkbox is unchecked. The 'Find Next' button is highlighted.

The Task Details Form is useful for managing resource work:

To add a resource:

1. If the task is Auto Scheduled, decide whether this should be 'effort driven'
 - if the additional resource shares the existing work and therefore the duration is shortened then Effort driven should be ticked

- if the additional resource is doing extra work on the task and the duration should therefore remain the same or even get longer, then un-tick the Effort driven option.
2. Choose the resource name from the drop down list
 3. Optionally type the number of hours work and overtime required
 4. Click OK

ID	Resource Name	Units	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	Architect	100%	8h	0h	0h	0h	8h
	Amenity Contractor						
	Architect						
	Bryan Hayden						
	Builder 1						
	Builder 2						
	Emma Robbins						
	Estate Agent						
	Excavation Contractor						
	Labourer 1						
	Mini Digger						
	Solicitor						
	Tony Butler (Surveyor)						

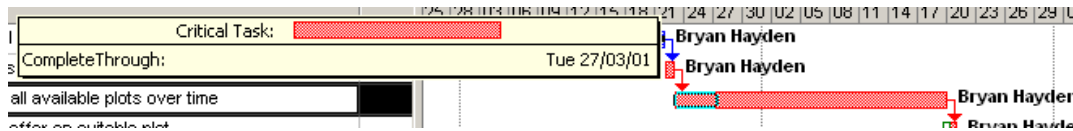
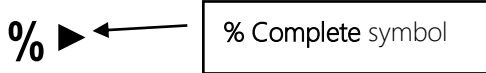
To remove a resource:

1. If the task is Auto Scheduled, decide whether this should be 'effort driven'
 - if removing the resource means the work still needs to be done then Effort driven should be ticked
 - if removing the resource means that the work allocated to that resource is no longer required, then un-tick the Effort driven option.
2. Select the resource name and press Delete on the keyboard.
3. Click OK

Using the Mouse on the Gantt Chart to update task progress

You can quickly change the task data using the mouse:

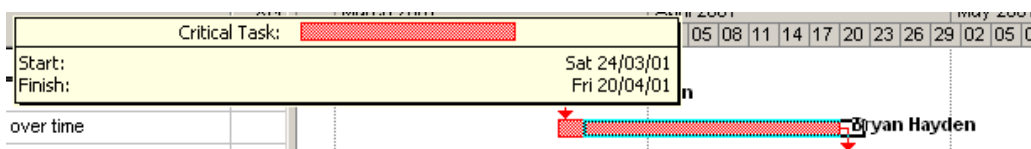
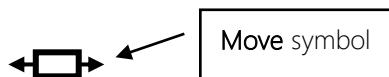
Updating the % complete



Positioning the pointer at the beginning of a bar will change the pointer to a % sign and if the left button is pressed and the symbol dragged to the right, a box will appear showing the amount of "percentage complete" that has been added (as shown above). This information will then be updated throughout the project and critical path (if appropriate).

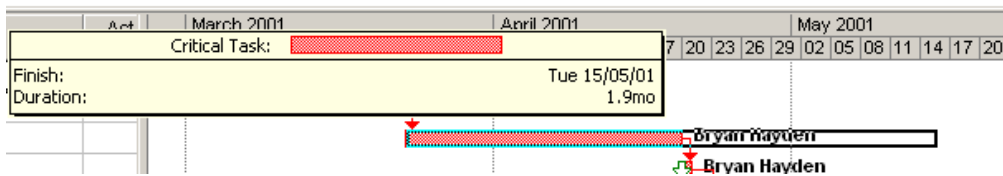
Changing duration and moving the task

If the pointer is placed in the centre of a task bar the cursor will change to a rectangle with left and right arrows. If the left button is held down with this cursor symbol you can drag the bar to the left or right in time, the changing dates will be shown and, as before, the system will be updated with the new information. Use this method (illustrated below) to **move** the task to a new time frame.



The duration of the task can be changed by changing the **length** of the bar. If the pointer is positioned at the right end of the bar it will change into a right pointing arrow. If the left button is held down with this cursor symbol you can change the length of the bar and the respective change in duration is shown in a box. Use this method (illustrated below) to **extend or shorten** the duration of the task.





Using the Network Diagram

The Network Diagram is also a useful view for adding, deleting and linking tasks.

Creating a new task

To create a new node (task) place the mouse cursor near the desired new position, hold down the left button and drag out a rectangle. This action creates a new task and the new task at this early stage (no task name, duration or anything) will appear in the task sheet as a new 'empty' task.

To enter the details of the new task, select the task and type in the relevant fields. Alternatively, double click the task to display the Task Information Dialog Box and use this to complete the information.

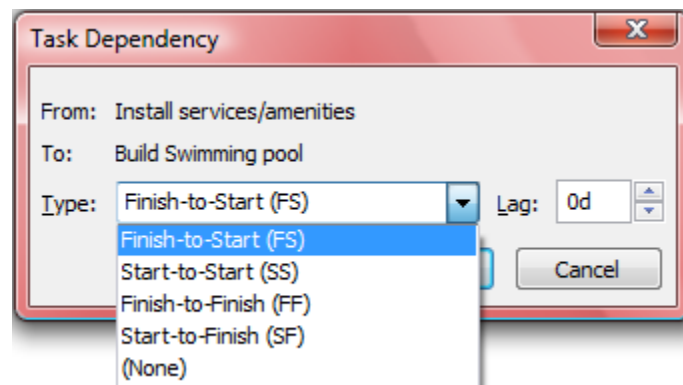
Deleting a task

Select the task and press Delete on the keyboard.

Linking tasks by working with nodes

Links between tasks are created by placing the pointer in the middle of one task and dragging to another task. This creates a Finish to Start dependency between the tasks and the node will move on the screen.

A link can be changed or deleted by double clicking the link line to display the Task Dependency dialog box:



Resource Usage and Task Usage views

The Usage views are useful for quickly adjusting the amount of work a resource needs to do and the dates when the work needs to be done.

- With the **Task Usage** view, resources are grouped under the tasks to which they are assigned:

[-] Clear land	140 hrs	Work				12h	24h
Labourer 1	56 hrs	Work				4h	8h
Mini Digger	1 Per hour used	Work				0.07	0.14
Emma Robbins	56 hrs	Work				4h	8h
Excavation Contractor	28 hrs	Work				4h	8h
+ Install services/amenities	32 hrs	Work					
[-] Design Garage	4 hrs	Work				4h	
Architect	4 hrs	Work				4h	

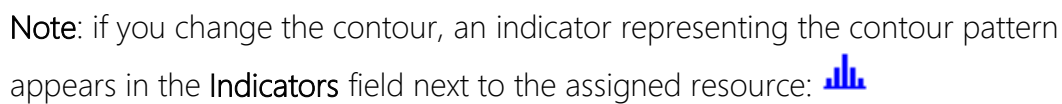
- With the **Resource Usage** view, tasks are grouped under the resources assigned to them:

[-] Bryan Hayden	208 h	Work	32h	24h	24h
Travel to France	16 h	Work			
Start searching for plot	8 h	Work			
View all available plots over time	160 h	Work	32h	24h	24h
Make offer on suitable plot	8 h	Work			
Pay deposit for plot	8 h	Work			
Complete application form	2 h	Work			
Submit plan	4 h	Work			
Pay balance on land acquisition	2 h	Work			
Builder 1	0 h	Work			
Builder 2	0 h	Work			

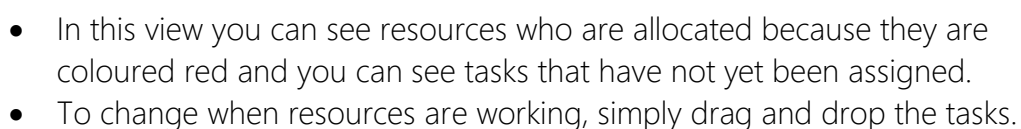
You can change the total work value for a resource assignment by entering a new value in the Work column

Double click a task to display the Assignment Information dialog box and use this to:

- apply a built in work contour
- apply a different cost table
- Change the **Start** and **Finish** dates of that particular resource assignment

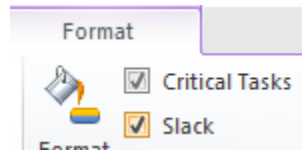


The Team Planner is a new view in Project that helps you view and manage your resources. To see the Team Planner, click the third view button on the status bar:



Displaying the Critical Path

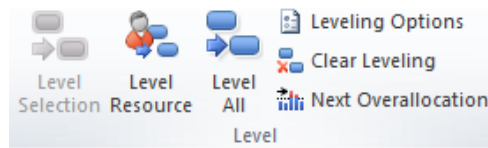
When amending tasks and resource allocations it is useful to see the critical/non-critical tasks and slack - on the Format tab, click the options for Critical Tasks and Slack:



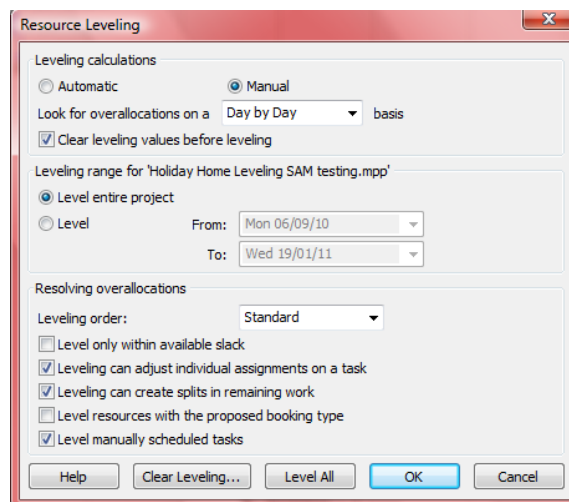
Using Resource Levelling

You can use Resource Levelling to manage over allocations.

On the Resource tab you can choose to level specific resource or all resources:



Choose Levelling options to change how this feature works:



- Select 'Automatic' if you always want over allocation to be eliminated automatically (the default is manual).
- Choose to level only within available slack if you do not want the completion date of the project to be affected.
- The Levelling order allows you to choose which tasks are delayed first – Standard means that the system will consider predecessor relationships, slack, dates, and priority to decide where the delays will be placed; whereas

Priority, Standard means that the manual priority that you set for a task is the most important criterion.

Understanding baseline and interim plans

Tracking is the process of comparing what actually happens during your project to what should happen or should have happened. In order to track your project you need to first save a baseline plan so that you can compare planned values against actual data.

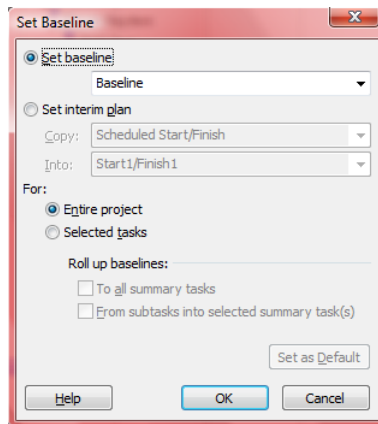
A baseline is a group of nearly 20 primary reference points (in five categories: start dates, finish dates, durations, work, and cost) that you record. As the project progresses, you can set additional baselines (to a total of 11 for each project) to help measure changes in the plan. For example, if your project has several phases, you can save a separate baseline at the end of each phase, to compare planned values against actual data.

Baseline information that consistently differs from current data may indicate that your original plan is no longer accurate, possibly because the scope needs review or because the nature of the project has changed. If project stakeholders agree that the difference warrants it, you can modify or rework the baseline at any time during the project. You may find that setting multiple baselines is especially useful for long projects or for projects in which the baseline is rendered irrelevant by significant changes to scheduled tasks or costs.

An interim plan is a set of current project data that you save after the project begins and that you can compare against the baseline to assess project progress. An interim plan saves only **two** kinds of information: the current start dates and finish dates for tasks. You can set up to 10 interim plans for a project.

Saving the first Baseline Plan

1. Click the Project tab
2. Click the Set Baseline command
3. Select Set Baseline
4. Click OK



Tip: Rather than re-baseline your entire project, you can set a baseline plan for specific tasks, such as tasks you add to your original plan.

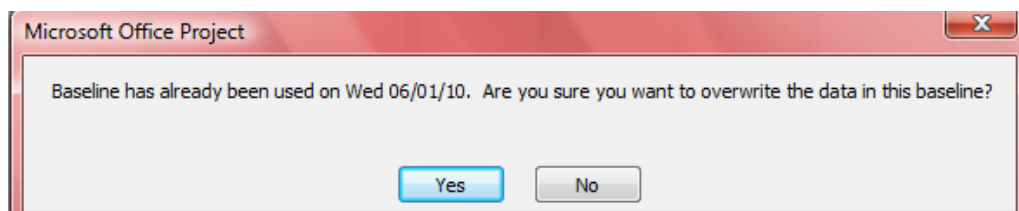
1. In the Gantt Chart, select the specific tasks
2. From the Project tab, select Set Baseline – Set Baseline
3. Select the option for **Selected tasks**
4. Click OK.

Tip: You can clear the baseline at any time:

1. From the Project tab, click the Set Baseline command
2. Choose Clear Baseline
3. If necessary choose the baseline that you want to clear
4. Click OK.

Tip: You can re save a baseline at any time:

1. From the Project tab, click the Set Baseline command
2. Choose Set Baseline
3. If necessary choose the baseline that you want to resave
4. Click OK.
5. Click Yes when prompted that you are overwriting data:



Set another baseline

If changes to your plan occur while your project is underway, you may find it helpful to save a second set of baseline data, rather than updating your existing saved data.

1. Click the Project tab
2. Click the Set Baseline command
3. Select Set Baseline
4. From the Baseline drop down list, select the baseline you want (for example to save a second baseline choose Baseline 1)
5. Click OK

Set an interim plan

Note: Interim plans store only start and finish date information and do not save work or cost data.

1. On the Project tab, click the Set Baseline command and click Set Baseline
2. Click Set interim plan
3. In the Copy box, click the start and finish or baseline values that you want to save
4. In the Into box, click the name of the interim plan into which you want to copy the values.

View project baseline information

After you set a baseline for the entire project, you can view the baseline data side-by-side with the current planned data, the actual data, and the variance.

1. On the Project tab, click Project Information.
2. Click Statistics:

Project Statistics for 'Holiday Home Leveling SAM testing.mpp'

	Start	Finish
Current	Mon 06/09/10	Tue 18/01/11
Baseline	Mon 06/09/10	Tue 18/01/11
Actual	NA	NA
Variance	Od	Od

	Duration	Work	Cost
Current	96.5d?	435h	£20,415.00
Baseline	96.5d	435h	£20,415.00
Actual	Od	0h	£0.00
Remaining	96.5d?	435h	£20,415.00

Percent complete:
 Duration: 0% Work: 0%

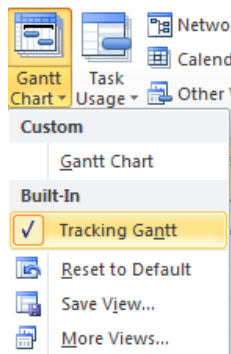
Close

Compare baseline and scheduled information

- To view variance information in a sheet view, on the View tab, select Tables, and then click Variance.

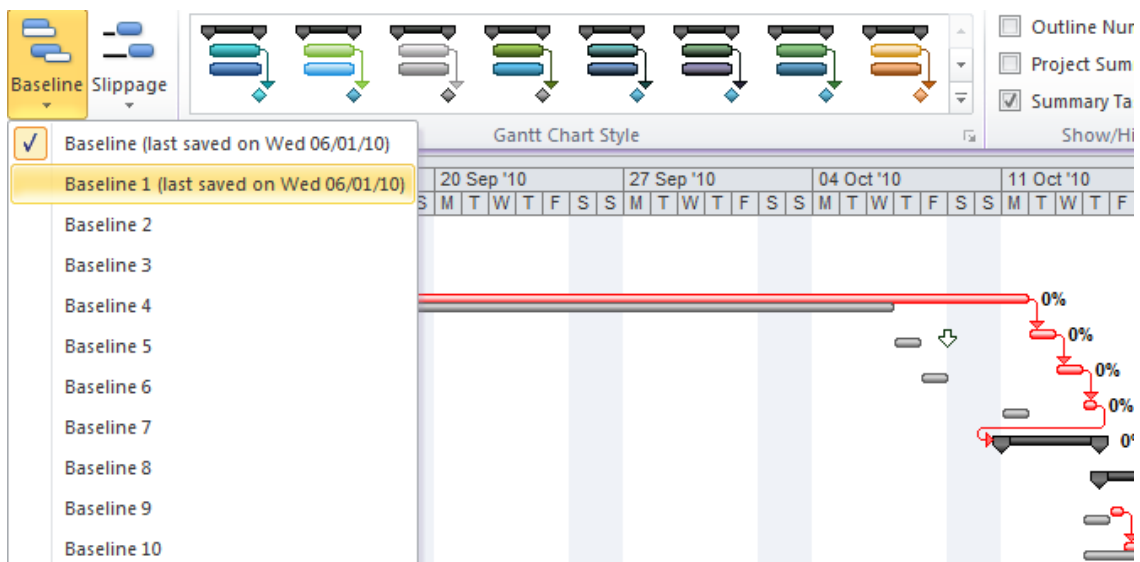
The Variance table shows start and finish dates for both scheduled information and baseline information, making it possible to evaluate your prediction of how the project would progress (baseline) by comparing that prediction with how the project is in fact progressing (actual).

- To view variance information visually, click the View tab, click the lower half of the Gantt Chart command button and choose Tracking Gantt.

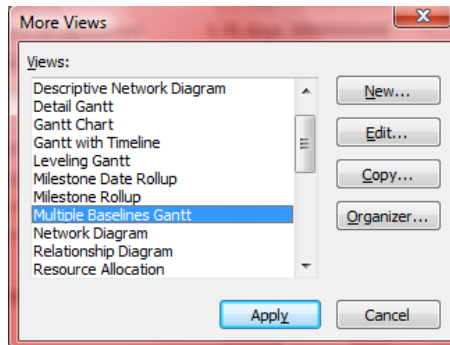


The baseline appears on the Gantt chart as grey bars underneath each of the existing bars and the % complete is displayed. By default the initial baseline data is displayed and if you wish to see a different baseline, from the Format tab click the Baseline command and choose the Baseline you wish to display.

:



- To view multiple baselines, click the View tab, click Other Views, More Views and chose Multiple Baselines Gantt:



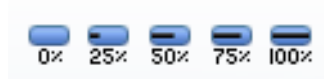
Note: The Multiple Baselines Gantt view shows the first three baselines (Baseline, Baseline1, and Baseline2).

Tracking and Updating Tasks Effectively

As work on your project progresses, you can update the plan with the actual start and finish dates, actual and remaining duration, current percent complete or amount of work that a resource has done.

Quickly updating tasks as % complete

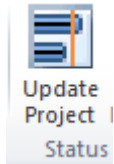
If you have tasks in your project that have been completed as scheduled, you can quickly update them using the % complete buttons on the Tasks tab of the ribbon:



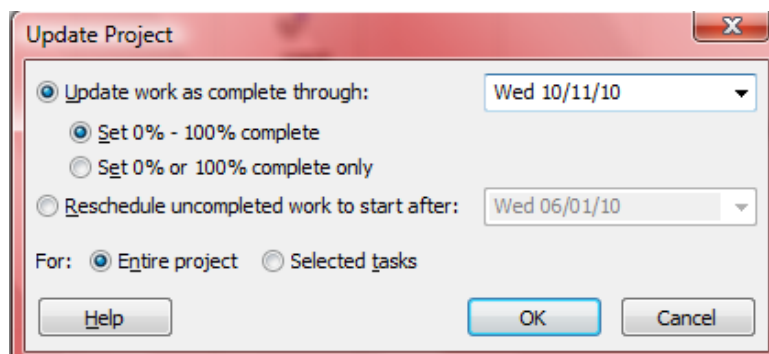
Quickly marking tasks on track

Select the tasks and click  **Mark on Track** ▼

Quickly updating your project to a specific date



1. On the Project tab, click the Update Project command button
2. Click the drop down box to choose the required date
3. Click OK



Note: if you don't specify a date, Project uses the current date.

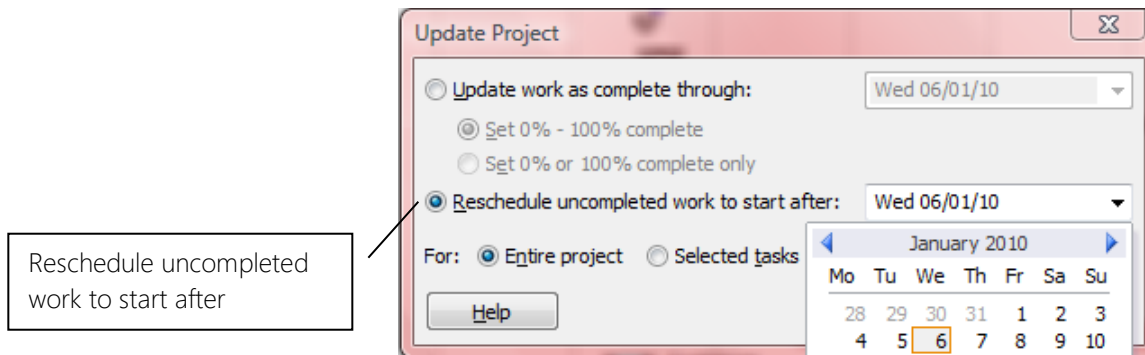
For those tasks that are **before** the **Update** date select one of the following:

- **Set 0% - 100% Complete.** For those tasks that **should be in progress** at the Update date, the **% Complete** value will be set in proportion to the Duration and respective dates.

- **Set 0% or 100% Complete.** If this option is selected where the task should be (or is) in progress, no percentage complete values will be added.

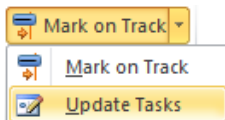
Reschedule uncompleted work

This option can be used to change the start date of those tasks that **should** have started but have slipped. The revised start date becomes the Update Date.



Using the Update Task form

On the Tasks tab, click the drop down arrow next to the Mark on Track command and click Update Tasks:



The 'Update Tasks' dialog box is shown. It has a 'Name' field with 'Travel to France' and a 'Duration' field with '2d?'. Below these are three spinners: '% Complete' (set to 0%), 'Actual dur' (set to 0d), and 'Remaining dur' (set to 2d?). There are two sections: 'Actual' and 'Current'. The 'Actual' section has 'Start' and 'Finish' dropdowns, both set to 'NA'. The 'Current' section has 'Start' and 'Finish' text boxes, set to 'Mon 06/09/10' and 'Tue 07/09/10' respectively. At the bottom are buttons for 'Help', 'Notes...', 'OK', and 'Cancel'.

Use the form to fill in any of the following:

- The actual % complete
- The date the task actually started
- The actual duration
- The remaining duration
- The date the task actually finished

Note: It is not necessary to complete all the field – for any fields not completed the system will calculate the revised data from the entries made.

USING THE TRACKING TABLE

The Tracking table is useful if you are updating the tasks. Click the View Tab on the ribbon, select the Tables command and choose Tracking. You can type information into the following columns:

- Act. Start:** The actual date the task started.
- Act. Finish:** The actual date the task was completed.
- % Comp.:** If the task is started but not finished, the percentage of the work completed.
- Phys. % Comp.:** The amount of 'Physical' work complete.
- Act Dur.:** The actual number of time periods that have been spent so far.
- Rem. Dur.:** The number of time periods left, calculated from the planned or scheduled length less the actual duration.
- Act. Cost:** This value is calculated from the cost of the resources allocated to the task, together with any fixed costs. If the task is marked 100% complete you can overwrite this value with the actual cost paid.
- Act. Work:** A measure of the work completed in hours calculated from the actual duration and units of each resource.

Using the Resource Usage view

On the View tab, click  **Resource Usage**

Right click and choose to display Actual Work

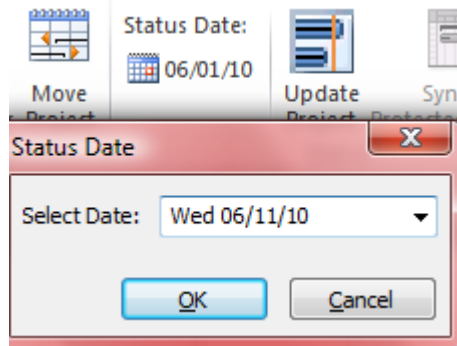
Fill in the actual work completed by each resource on each task:

Travel to France	16 hrs	Work	2h	8h	6h	
		Act. W	2h			
<i>Start searching for plot</i>	8 hrs	Work			2h	6h
		Act. W				
<i>View all available plots over time</i>	160 hrs	Work				2h
		Act. W				
<i>Make offer on suitable plot</i>	8 hrs	Work				
		Act. W				
<i>Pay deposit for plot</i>	8 hrs	Work				
		Act. W				
<i>Complete application form</i>	2 hrs	Work				
		Act. W				
<i>Submit plan</i>	4 hrs	Work				
		Act. W				
<i>Pay balance on land acquisition</i>	2 hrs	Work				
		Act. W				

Tip: You can zoom the view so that you can fill in the information on a daily/weekly/monthly basis.

Exercise: Updating the Holiday project

1. Open the **5 - Holiday Home Update.MPP** project
2. Baseline the project
3. Determine a date approximately a third through the project at which the early tasks can be updated and on the Project tab, click the Status Date command and type in this date



4. Complete the following table to define which tasks will be updated and what happened to them:

Task Name	Actual Start Date	Actual End Date	% Com	Actual Duration	Remaining Duration
Travel to France					
Start searching for plot					
View all available plots over time					
Make offer on suitable plot					
Pay deposit for plot					
Have deeds checked					

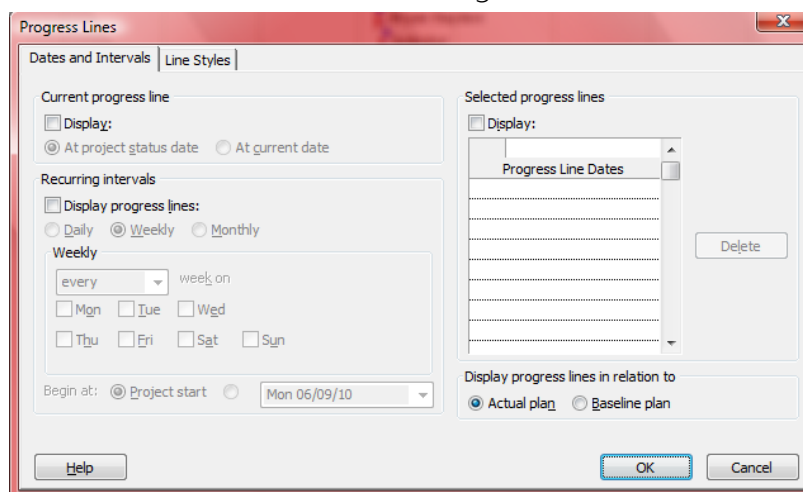
5. Using the **Tracking** table, update the tasks from the data in the table above.
6. View the **Tracking Gantt** and check for problems.
7. Close the Project **do NOT save the changes**.

Viewing Progress Lines

A Progress line is a visual representation of the progress of your project. For a given progress date, Microsoft Project draws a progress line connecting in-progress tasks, thereby creating a graph on the Gantt Chart with peaks pointing to the left for work that is behind schedule and peaks pointing to the right for work that is ahead of schedule. The distance of a peak from the vertical line indicates the degree to which the task is ahead of or behind schedule at the progress date.

To view Progress Lines

1. Right click the Gantt Chart and choose Progress Lines from the shortcut menu:

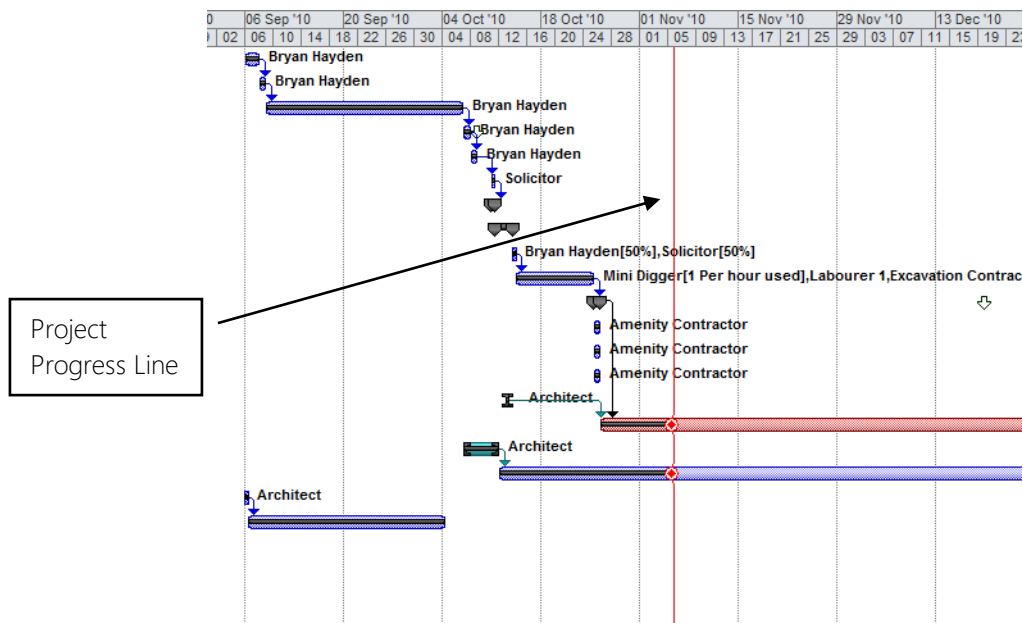


2. Click the Dates and Intervals tab and select the display options:
 - To always display the current progress line, select the Always display current progress line check box, and then click At project status date or At current date to indicate where you want the progress line drawn.
 - To display a progress line at specific time intervals, select the Display progress lines at recurring intervals check box, click Daily, Weekly, or Monthly to specify a time interval, and then click the options you want.
 - To begin progress lines at the beginning of the project, under Begin at, click Project start; otherwise, click the date option and then type or select the date on which you want the progress lines to start.
 - To display a progress line on a specific date, select the Display selected progress lines check box, and then type or select the dates for which you want progress lines displayed. To delete a date for which you have set progress lines, select it, and then click Delete.
 - To show progress compared with a baseline plan, under Display progress lines in relation to, click Baseline plan.

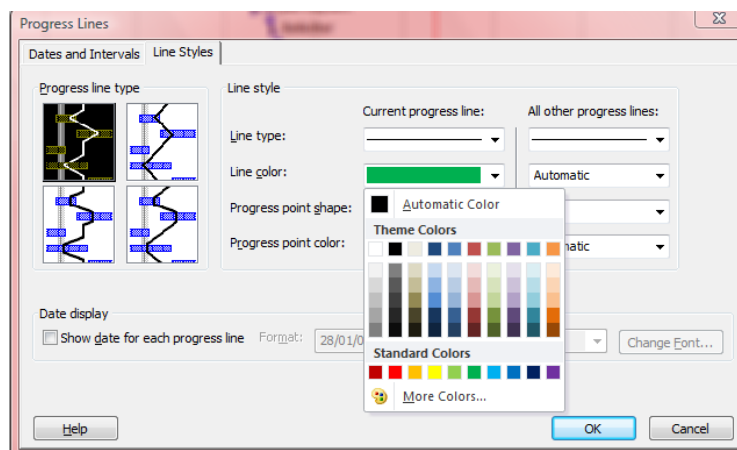
Exercise: Show the Project Progress Line

1. Open the 5 - Holiday Home Update.MPP project
2. Baseline the project
3. On the Project tab, select Update Project.
4. Set the **Update work as complete through** field to 5/11/
5. Click OK.
6. Click OK to planning wizard
7. Right click the Gantt Chart and choose Progress Lines
8. Select the option to display **at project status date**.

Your project should look similar to the following:



9. Double click the progress line and on the Line Styles tab choose a different Line Color and click OK:



Understanding project costs

Costs are an important aspect of project scheduling and control. Project provides for several types of costs. By using Project, you can enter and track the following types of costs:

Rate-based, a cost that is calculated based on the pay rates that are specified for a resource and the amount of work that is performed by that resource.

Per-use, a cost that is incurred either once each time that a resource is used, or once for each complete task that the resource is assigned to.

Fixed, a cost that is set for a task and not for a resource. A fixed cost does not change, regardless of task or the work performed on the task by a resource.

Cost resource, a resource that allows you to accumulate one-time or periodic costs that belong to a task. Cost resources might include airfare and accommodation. This is typically a one-time cost per task, although there can be several separate entries for this cost over the life of a task.

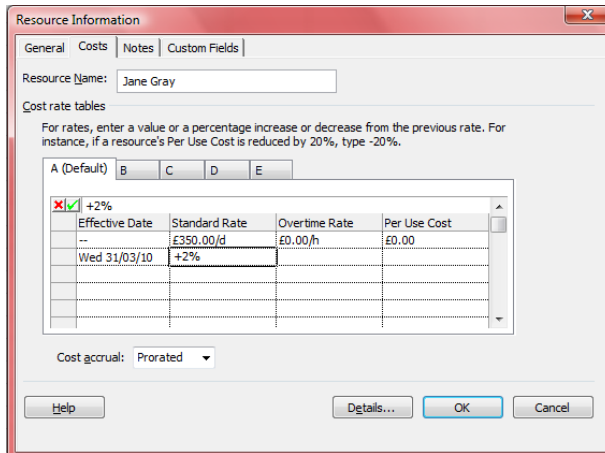
Notes

- More than one type of cost can be entered for a single work resource. For example, you might enter an hourly rate for the resource's work, but also a per-use cost for the travel time or other expenses.
 - The various cost types operate in differing ways, depending upon whether the resource is defined as work, material or cost. For work resources, the rate is applied per unit of time. For material resources and cost resources, the rate is applied per other specified units (such as tons, yards, or the units of a selected currency).
 - When creating resources in the Resource Sheet, you can specify when the costs accrue. Project prorates costs by default and calculates cost accrual based on the percentage of the task completed, distributing the accrual over the whole duration of the task. However, you can also have costs accrue either at the start of a task (if you have a lump-sum amount that is payable at the start), or at the end of the task (if you are holding payment until the work is finished).
-

Rate-based costs

- Rate based costs are entered on the resource sheet in the Standard and Overtime Rate columns.
- Rate-based resource costs are costs of work resources, such as people or rental equipment, to which you assign standard and (if appropriate) overtime rates. The rates can be on an hourly, daily, weekly or yearly basis. When you assign a resource to a task, Project calculates the total resource cost by using the specified resource rates and the time (or duration) that it takes to accomplish the task.
- Project does not automatically calculate additional hours as overtime work, unless you specifically assign the additional hours as overtime. Because work always represents the total amount of work completed, the amount of overtime work is included in, not added to, the total amount of work. For example, if a person is scheduled to work 40 hours over four days, consisting of 8 hours of regular work and 2 hours of overtime work per day, you assign 10 hours of work per day, and then designate 2 hours of those 10 as overtime work.
- Rate-based material costs are the costs of consumable material resources, such as building materials or supplies, to which you assign standard rates (but typically not rates calculated per hour). To assign costs for material resources, you set the rate per unit of material, such as a cost per metre, litre or unit. When you assign a material resource to a task, Project calculates material cost totals by multiplying the specified material resource rate by the number of material units used to complete the task.
- You can establish up to five different cost rate tables for each resource - so that if a resource charges separate rates for separate types of work, you can cover this. For example, if a carpenter charges a higher rate for finish work than for framing, you can apply one cost rate table to the finish work assignment and another to the framing assignment.
- In each cost rate table, there are up to 25 rows that you can use to enter future rate changes (such as pay rate increases or material cost changes). For each rate change, you specify the date that the change takes effect. For example, if you know that a resource will receive a pay increase in six months, you can set Project to automatically start using the new rate at that time.

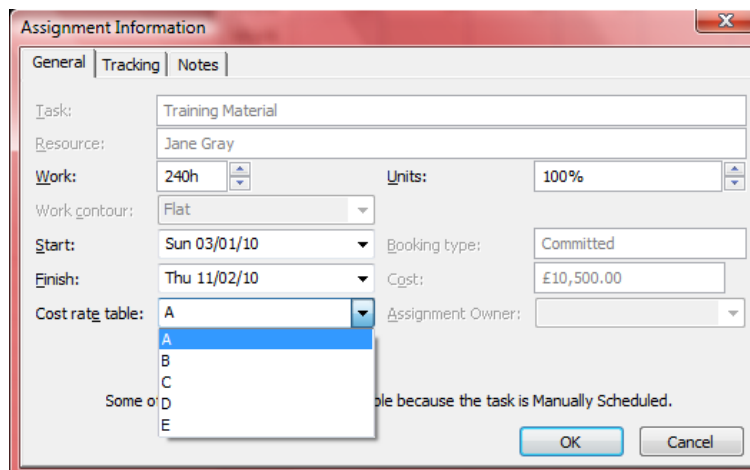
To view/amend different cost rates for a resource, double click a resource to display the Resource Information dialog box and enter the information on the Cost tab:



The 'Resource Information' dialog box is shown with the 'Costs' tab selected. The 'Resource Name' is 'Jane Gray'. Under 'Cost rate tables', there is a table with columns: Effective Date, Standard Rate, Overtime Rate, and Per Use Cost. The first row shows a rate of £350.00/d from an unspecified date to Wed 31/03/10. A second row shows a '+2%' change starting on Wed 31/03/10. Below the table, 'Cost accrual' is set to 'Prorated'. Buttons for 'Help', 'Details...', 'OK', and 'Cancel' are at the bottom.

Effective Date	Standard Rate	Overtime Rate	Per Use Cost
--	£350.00/d	£0.00/h	£0.00
Wed 31/03/10	+2%		

To allocate a different cost table to a task, double click the task in the **Resource Usage** and chose the required table:



The 'Assignment Information' dialog box is shown with the 'General' tab selected. The 'Task' is 'Training Material' and the 'Resource' is 'Jane Gray'. 'Work' is set to 240h and 'Units' to 100%. 'Work contour' is 'Flat'. 'Start' is 'Sun 03/01/10' and 'Finish' is 'Thu 11/02/10'. 'Booking type' is 'Committed' and 'Cost' is '£10,500.00'. The 'Cost rate table' dropdown is open, showing options A, B, C, D, and E. A note at the bottom states 'Some of the cost rates are not applicable because the task is Manually Scheduled.' Buttons for 'OK' and 'Cancel' are at the bottom right.

Per-use costs

- Per-use costs are entered on the resource sheet in the Cost/Use column.
- Per-use costs are one-time fees for the use of a resource, such as equipment. Per-use costs never depend on the amount of work done. Instead, they are one-time costs that are incurred each time the resource is used. Although a per-use cost for a work resource depends on the number of assignment units used, a per-use cost for a material resource is applied only once. For example, a per-use delivery cost of £100 for a material resource like cement is applied only once per delivery, whether 10 tons of cement are delivered or 100 tons.

Fixed costs

- You set fixed costs in a task view (such as a Gantt Chart) by applying the appropriate Cost table, and then typing the cost amount in the Fixed Cost column.
- Fixed costs are costs for a task that remain constant regardless of the task duration, the amount of work performed by the resource, and the number of assignment units. For example, if a carpenter is a rate-based resource (that is, if he or she is paid hourly or daily) and is scheduled to complete a task in five days but actually takes seven days to complete it, the carpenter is paid more than was budgeted. If the carpenter is paid a fixed cost for the work, however, the cost remains the same, no matter how long the task takes to complete.
- You can assign fixed costs to a task to which rate-based resource costs are also assigned.

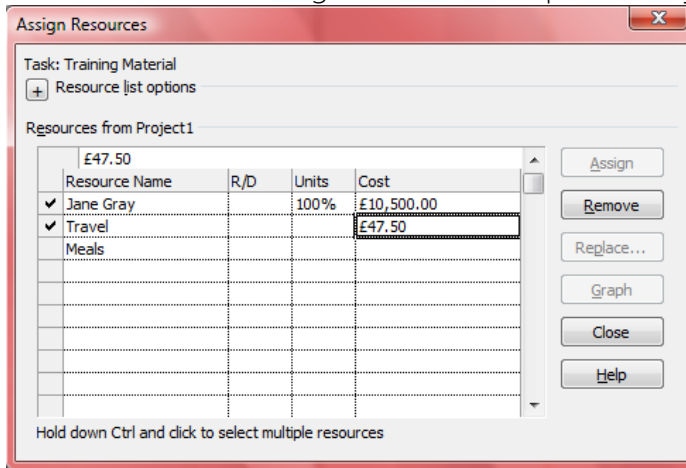
Cost resources

- Cost resources (such as travel or accommodation) are created as a type of resource in the Resource Sheet.

Resource Name ▼	Type ▼	Material ▼
Jane Gray	Work	
Travel	Work ▼	
	Work	
	Material	
	Cost	

- Cost resources are used when you want to apply (to a single task) multiple separate miscellaneous costs that aren't changed by the amount of work performed on the task. For example, an executive working on a new project proposal might have three separate cost resources applied to him or her: one for airfare, one for food expenses, and one for hotel room expenses. In this way, several "fixed" costs can be applied to a single task. Unlike with work resources and material resources, cost rates cannot be applied to cost resources.

- After you create the cost resource, you assign it to tasks using the Assign Resources dialog box. It is at this point that you type in the amount:



Exercise: Adding costs

1. Open the Holiday Home Update.MPP project.
2. Apply the cost table to the Gantt Chart view
3. Select the Build Swimming Pool task.
4. In the Fixed Cost field, type 5000.
5. In the Resource Sheet create a cost resource called accommodation
6. Assign the accommodation cost resource to task **View all available plots over time** and type the value of 900

Creating a budget

Creating a budget by using a bottom-up method

In a bottom-up approach, base rates or per-use costs for resources, and fixed costs or cost resources for individual tasks are estimated and then Project calculates totals for the entire project.

1. Enter the tasks and durations on the Gantt chart
2. Enter the resources with appropriate type and pay rates on the Resource sheet
3. Assign resources to the tasks (Gantt Chart and the Assign Resources dialog box)
4. Display the Cost table
5. Enter any fixed costs
6. View the calculated costs
(tip: display the Project Summary Task to see the total cost of the whole project)

Task Name ▼	Fixed Cost ▼	Fixed Cost Accrual ▼	Total Cost ▼
<input type="checkbox"/> Holiday Home	£0.00	Prorated	£20,415.00
Travel to France	£0.00	Prorated	£640.00
Start searching for plot	£0.00	Prorated	£320.00
View all available plots over time	£0.00	Prorated	£6,400.00
Make offer on suitable plot	£0.00	Prorated	£320.00
Pay deposit for plot	£0.00	Prorated	£320.00
Have deeds checked	£0.00	Prorated	£300.00
<input type="checkbox"/> Apply for Certificate of Urbanism	£0.00	Prorated	£255.00
<input type="checkbox"/> Apply for planning permission from Mairie	£0.00	Prorated	£1,090.00
Pay balance on land acquisition	£0.00	Prorated	£230.00
Clear land	£0.00	Prorated	£5,740.00
<input type="checkbox"/> Install services/amenities	£0.00	Prorated	£2,400.00

Project calculates the total estimated costs - if this total is not in alignment with your budget, you must adjust pay rates, resource assignments, and so forth.

After you refine the estimated costs, you can save a baseline plan. The baseline plan is a snapshot of your schedule at the time that you save the baseline and includes information about tasks, resources, and assignments, thereby establishing a budget for the project.

With a budget in place, you can compare actual expenditures against the amounts that you planned to spend and then make any necessary adjustments to stay within the budget. Project calculates the task's cost based on the project's progress. When a task is marked 100% complete you can enter specific costs, if needed.

Creating a budget by using a top-down method

The top-down approach allows you to allocate sums of money to the project summary task rather than to individual resources/tasks.

- Create budget resources that represent the overall budget for the project:
- Enter the resource on the resource sheet and define it as a cost resource
- Double click the resource and click the option Budget:

- Assign the budget resources to the project summary task.
On the Gantt Chart make sure the Project Summary Task is displayed
Use the Assign Resources Dialog Box to assign the budget resource
- Enter values for the budget resources.
In the Task Usage View insert the Budget Cost Column and type the value

Task Name	Budget Cost
<input checked="" type="checkbox"/> Holiday Home	£6,000.00
<i>Travel</i>	<i>£4,000.00</i>
<i>Accommodation</i>	<i>£2,000.00</i>

Viewing total resource costs

Apply the cost table to the Resource Usage View:

[-] Amenity Contractor	£2,400.00	Cost	£1,200.00	£1,200.00
Install services/amenities	£600.00	Cost	£300.00	£300.00
Connect Sewerage	£600.00	Cost	£300.00	£300.00
Connect Electricity	£600.00	Cost	£300.00	£300.00
Install water pump	£600.00	Cost	£300.00	£300.00
[+] Emma Robbins	£2,900.00	Cost	£200.00	
Tony Butler (Surveyor)	£0.00	Cost		
[+] Estate Agent	£75.00	Cost		
[+] Excavation Contractor	£2,100.00	Cost		
[+] Solicitor	£750.00	Cost		
[-] Architect	£3,000.00	Cost		
Have outline plans drawn up	£600.00	Cost		
Design Garage	£300.00	Cost		

Detail Styles...
Work
Actual Work
Cumulative Work
Overallocation
☒ Cost
Remaining Availability
Show Timeline
Show Split

The total cost for each resource is displayed together with the cost of that resource for each task

Note: right click on the right hand side of the view to display cost information across the timeline

Viewing total task costs

Apply the cost table to the Task Usage View:

[-] Clear land	£0.00	Prorated	£5,740.00	Cost		£560.00	£1,120.00
Labourer 1			£840.00	Cost		£60.00	£120.00
Mini Digger			£0.00	Cost		£0.00	£0.00
Emma Robbins			£2,800.00	Cost		£200.00	£400.00
Excavation Contractor			£2,100.00	Cost		£300.00	£600.00
[+] Install services/amenities	£0.00	Prorated	£2,400.00	Cost			
Amenity Contractor			£600.00	Cost			

Cumulative Work
Baseline Work
☒ Cost
Actual Cost
Show Timeline
Show Split

The total cost for each task is displayed and broken down by each resource on that task.

Note: right click on the right hand side of the view to display cost information across the timeline

Reducing project costs

There are a number of ways to reduce costs:

1. Reduce the standard/overtime rate paid to a resource
2. Reduce the duration of the task
3. Where possible avoid scheduling any overtime.
4. Use cheaper resources
5. Cut the scope of the project – delete tasks

Note: Baseline your project before you make any of these changes so that you can see the impact on the costs and schedule.

Project Deliverables

Overview of Project Deliverables

A deliverable is a tangible, verifiable outcome of work done to produce a product or a service. To be verifiable, the deliverable must meet predetermined standards for its completion, such as design specifications for a product (like a new car) or a checklist of steps that is completed as part of a service (like maintenance of factory machinery).

Deliverables have stakeholders. Stakeholders who receive the finished product or service are external, such as another team that depends on the deliverable to do their own work or a company's customers. And stakeholders who work on the deliverable directly are internal, such as a project manager and team members. The stakeholders must accept the finished state of the deliverable.

Creating a schedule focused on deliverables

A project may have only one deliverable or it can have many deliverables. You can organise your project's tasks around the deliverables in several ways:

- Divide each deliverable into a separate phase of the project, and use a milestone that represents both the completion of the deliverable and phase simultaneously. Each deliverable can be linked to a separate phase of the project. For example, a project to construct a building may have one phase with a deliverable of "finish exterior of building," and the deliverable for a later phase may be "landscaping complete."
- Group similar deliverables or deliverables with the same stakeholders in a phase. This method allows you to schedule a team to work on a project until the deliverable is handed off. Then they can move on to other projects. For example, all routine maintenance tasks can be organized in one phase of the project corresponding to the dates they need to be performed. The maintenance engineers can be assigned to multiple projects containing the different maintenance jobs they are assigned to.
- Group deliverables worked on during the same time period in phases spanning that time period. This is useful for projects where tradeoffs can be made in the scope and quality of the deliverable in order to meet a fixed finish date. For example, if conversion of a factory production line must be completed by the date the first product is delivered to suppliers,

there may be phases for each month leading up to the finish date containing the tasks that must be started or completed during that month. So that slipped tasks don't affect the overall progress of the project, tasks that are not finished by the end of the phase are often completed separately after the team has moved on to the next phase.

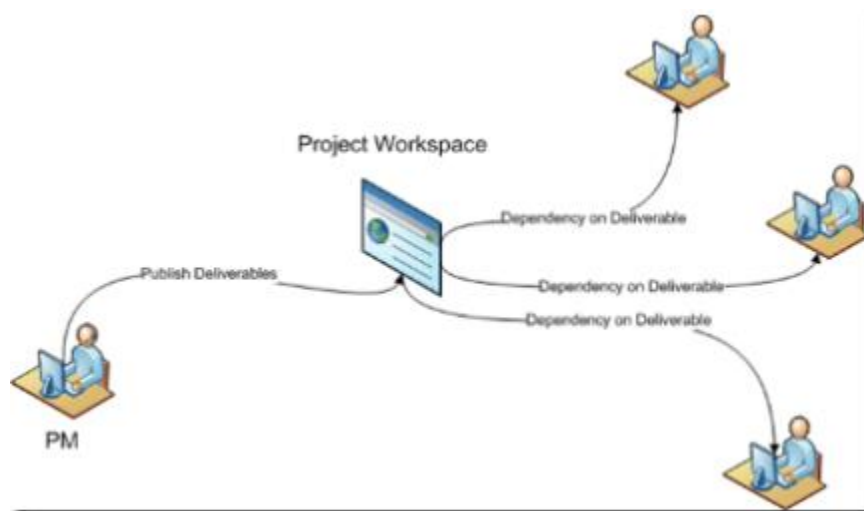
Project Server and Deliverable Fields

Deliverables is a well known project management term, but it is also a new feature in Project Professional if you are using Project Server and have created a workspace for the project.

Note: This training course does not cover Project Server: the brief notes given here are for background information.

Deliverables provides the ability to publish key dates to a SharePoint site and for others to consume these key dates within their project plan. This feature helps you to manage cross project dependencies. A project manager can define deliverables within their project plan using Project Professional and have the dates automatically published to a Deliverable SharePoint list within the Project's workspace. This allows other project managers to take dependencies on the published deliverables within their own Project Plans. When there is a change with a deliverable, such as a change in the finish date, all the project managers who have taken a dependency on the deliverable get informed of the change with the deliverable when they open their project plan. Deliverables provide a way to loosely tie projects together.

This diagram illustrates deliverables at a high level:



When a project manager creates a deliverable or a dependency on a deliverable they have the option to link it to a task. When a deliverable or dependency is linked to a task, it shows an icon beside the task name and displays bars on the Gantt chart. It is important to note that the dates of the task are not tightly coupled with the dates of the deliverable. This is to allow the project manager to work with his/her schedule without altering the dates of the deliverable.

Since the deliverables are published to a SharePoint list, there are many built in benefits. Users can easily setup alerts, create RSS feeds, add additional columns, etc. It is important to note that if you change a deliverable from the SharePoint List, it will give the PM the option to sync the change next time they open their project in Project Professional.

You can insert any of the following columns into the Task Sheet:

- **Deliverable Type** indicates whether the current task has an associated deliverable, and whether that deliverable is produced by the current task or produced by a separate project or task upon which the current task is dependent.
- **Deliverable Name** displays the name or title of the associated deliverable.
- **Deliverable Start** displays the scheduled start date of the associated deliverable.
- **Deliverable Finish** displays the scheduled finish date of the associated deliverable.
- **Deliverable GUID** displays the unique identification code of the associated deliverable.

Note: These are calculated columns only – the information cannot be edited here.

Module 7: Printing and Reporting

Objectives

At the end of this module you will be able to

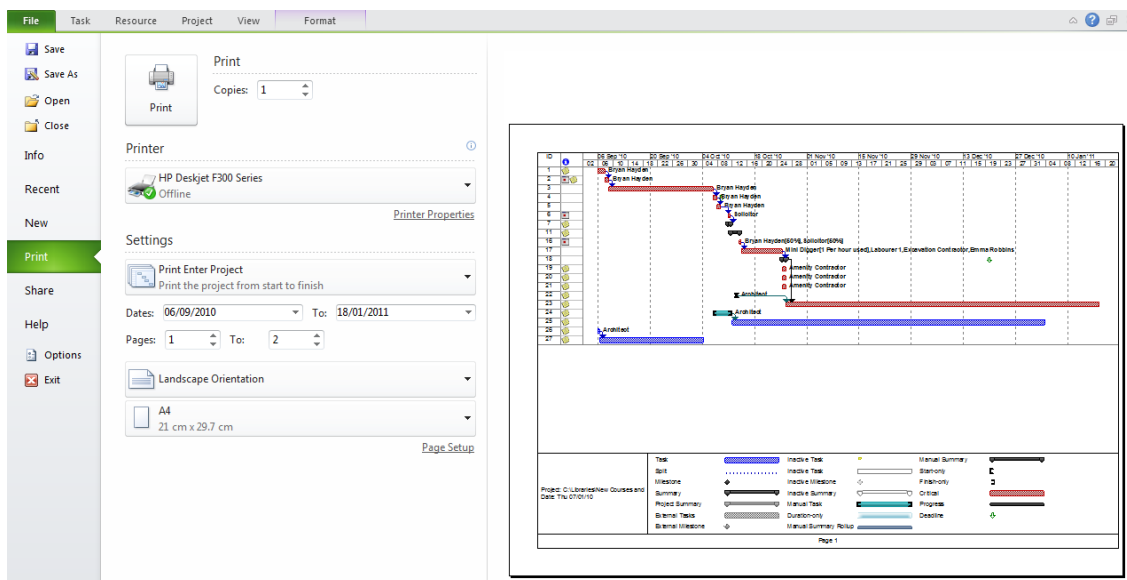
- Change the print settings
- Print different views
- Print project reports

Printing project views

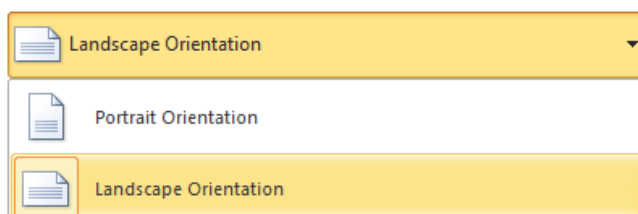
- You can print most project views, but you cannot print split screen views.
- Printing of the Gantt Chart is WYSISYG – change the zoom of the view and the columns displayed to control what is printed.
- When you print the Gantt Chart the TimeLine is NOT printed.

Viewing and changing the print settings

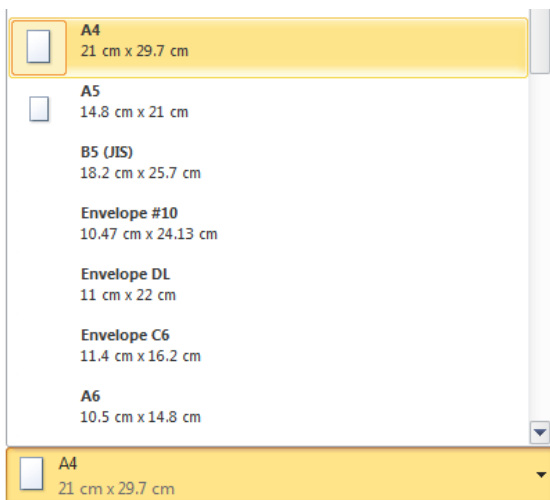
Click the File tab and choose Print:



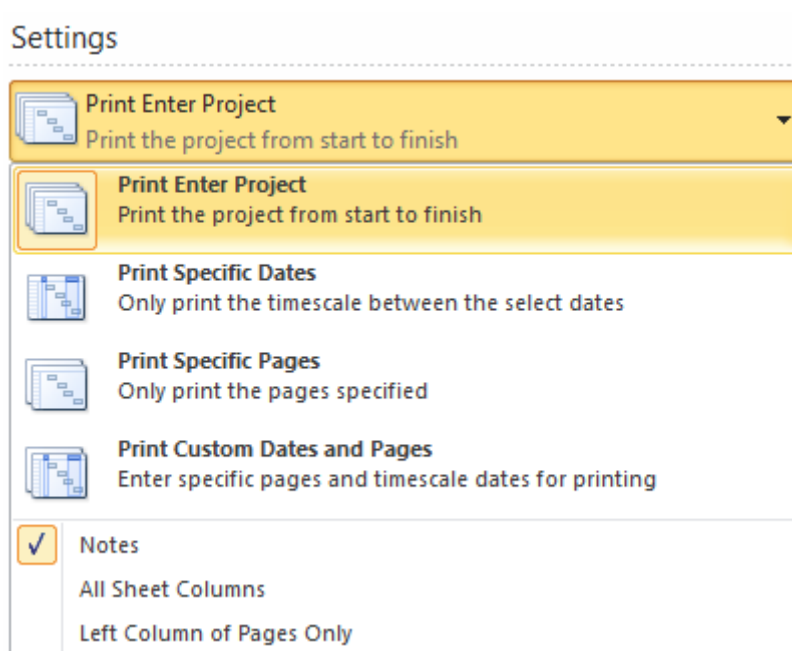
From this screen you can change from Landscape to Portrait Orientation:



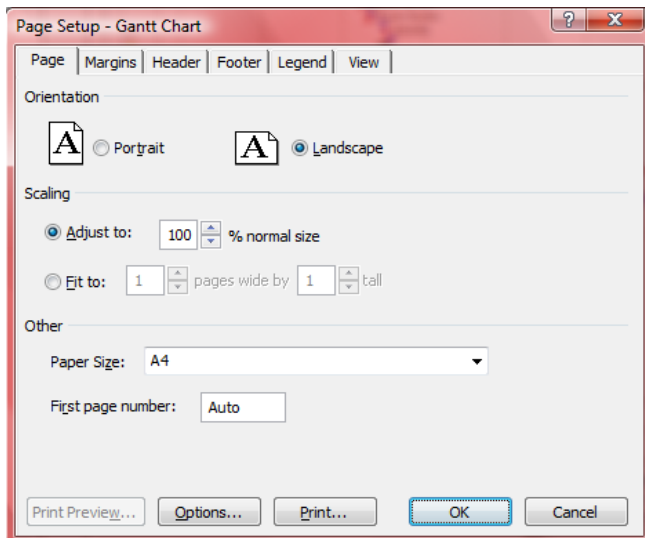
And you can change the paper size:



Click the Settings link to choose to print notes, etc:



Or, if you prefer to use the dialog box available in previous versions of Project, click the Page Setup link.

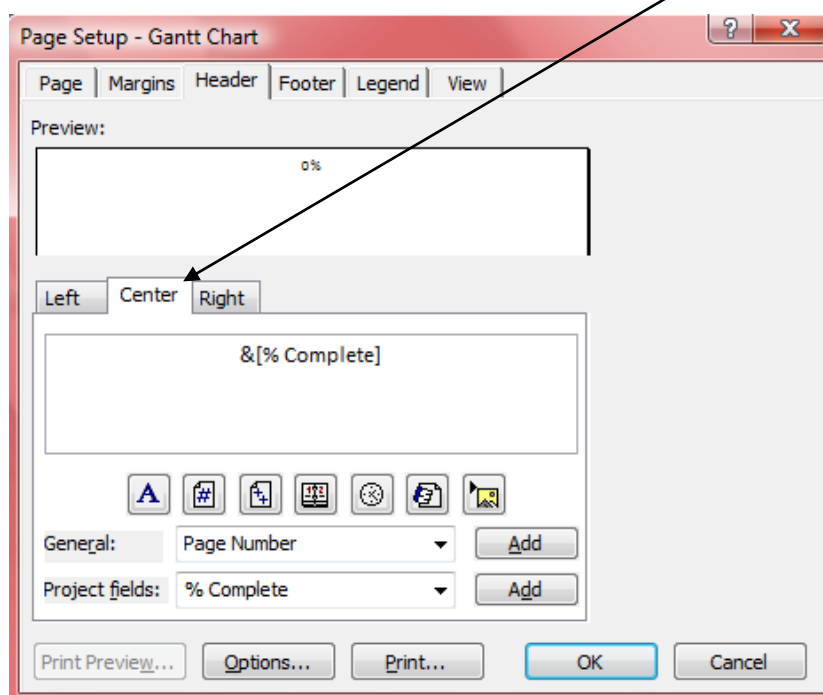









In the dialog box the following tabs can be selected: -

- Page:** Choose orientation and scaling.
- Margins:** Set the margins and borders.
- Header:** Control how the header section will be printed.
- Footer:** Control how the footer section will be printed.
- Legend:** Control how the legend is printed
- View:** Choose number of columns, print notes, etc.

Add a header, footer, or legend to a view

- On the File tab, choose Print and click the Page Setup link.
- On the **Header**, **Footer**, or **Legend** tab, click the **Left**, **Center**, or **Right** tab.

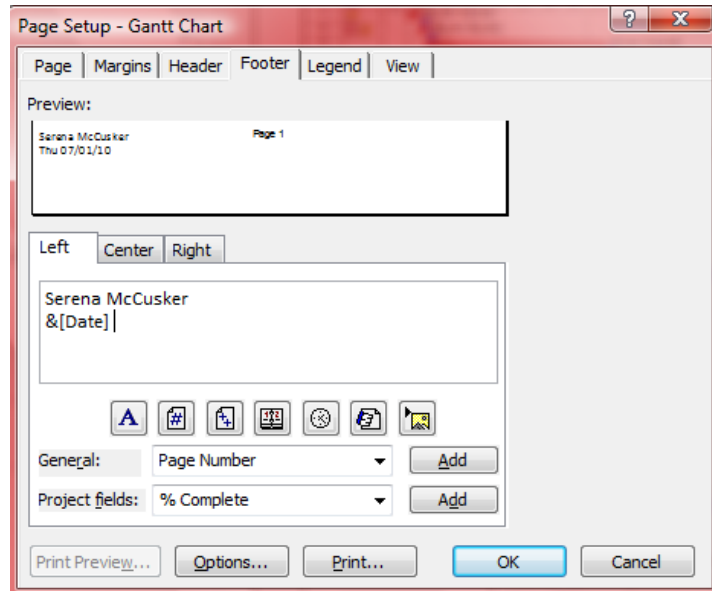


- In the text box, type or paste text, add project information, or insert or paste a graphic:
 - To add page numbers, click **Insert Page Number** , **Insert Total Page Count** , or both.
 - To add the current date or time, click **Insert Current Date** , **Insert Current Time** , or both.
 - To add the file name, click **Insert File Name** .
 - To add a graphic, click **Insert Picture** .
 - If required, select the text that you want to format, click **Format Text Font** , and then select the formatting options that you want.
 - To add project-specific information, select the information that you want in the **General** and **Project fields** boxes, and then click **Add** for each entry. Repeat this step to add more project information.

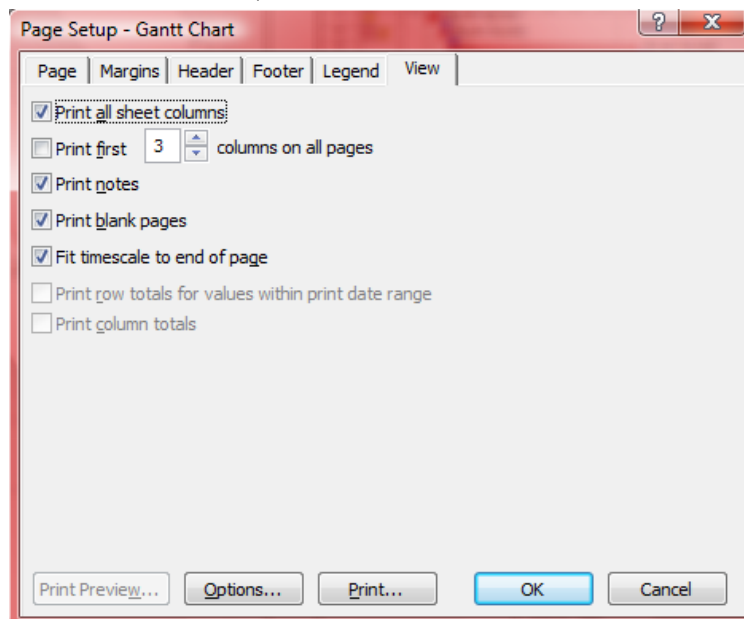
Note: You can create multiple-line headers, footers, and legends. At the end of the first line of text or information, press ENTER. Headers can have up to five lines of information. Footers and legends can have up to three lines.

Exercise: Change the print settings

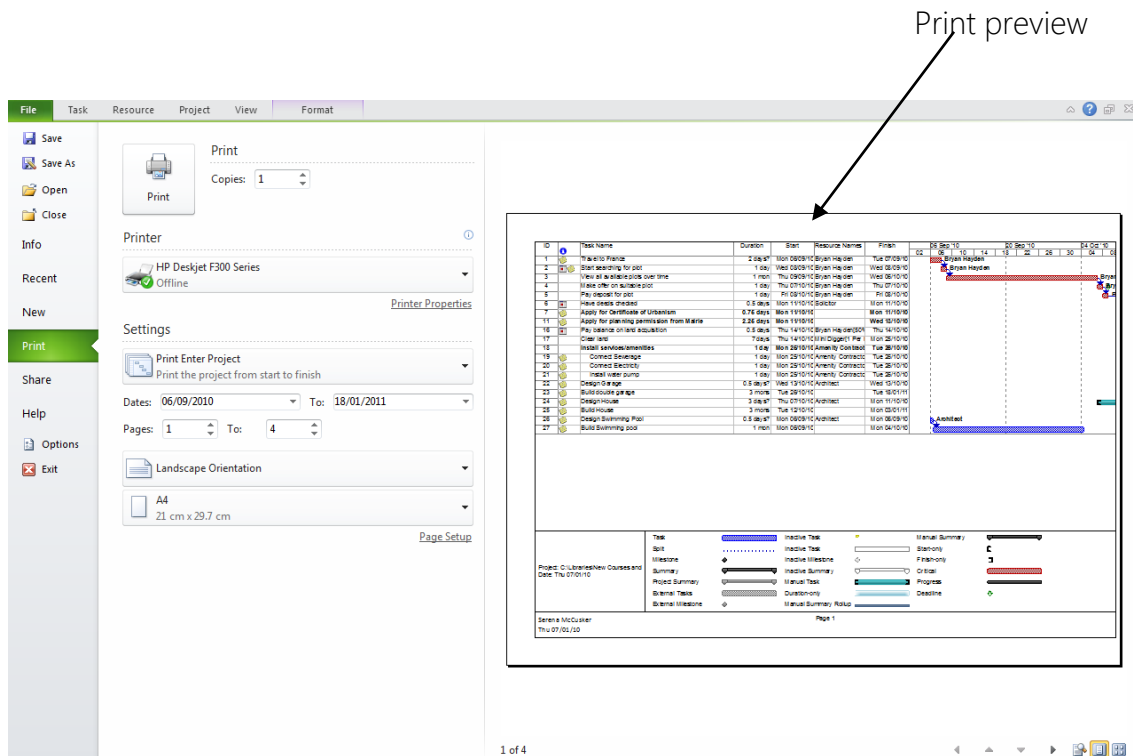
1. Open the Holiday Home.MPP project (created earlier) and ensure you are viewing the Gantt Chart.
2. Click the File tab, choose Print and click the **Page Setup** link.
3. On the Footer tab type your name in the left section, press Enter and click the Date button:



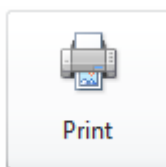
4. On the View tab select the options to Print all sheet columns and to Print notes:



5. Click OK to preview the project on the right hand side of the Print screen:

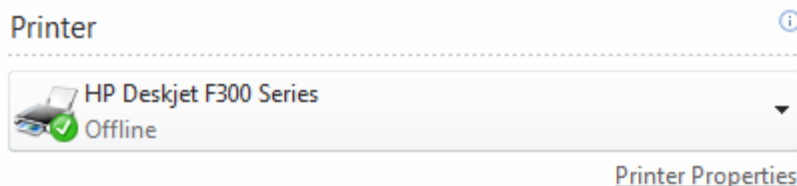


Tip: Use the buttons at the bottom right of the print preview screen to view the other pages:



If you want to print the project click the Print command button – this will print to your default printer

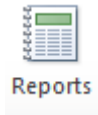
You can change the printer and printer options if required:



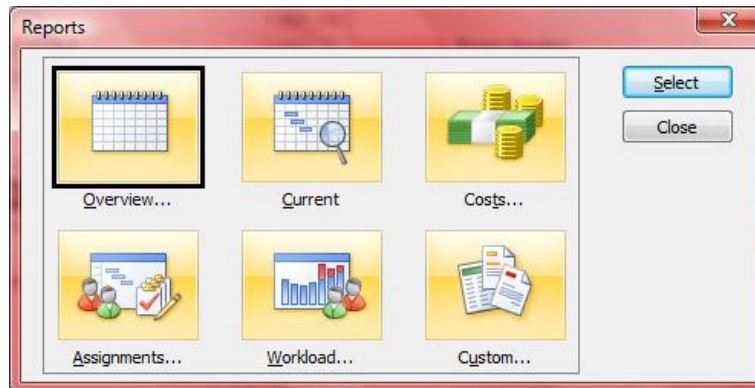
- To return to the Gantt Chart view, click the Tasks tab on the ribbon.

Reports

Project has a number of pre-defined reports based on some principal types which can be used directly or changed as required. Alternatively completely new reports can be created.

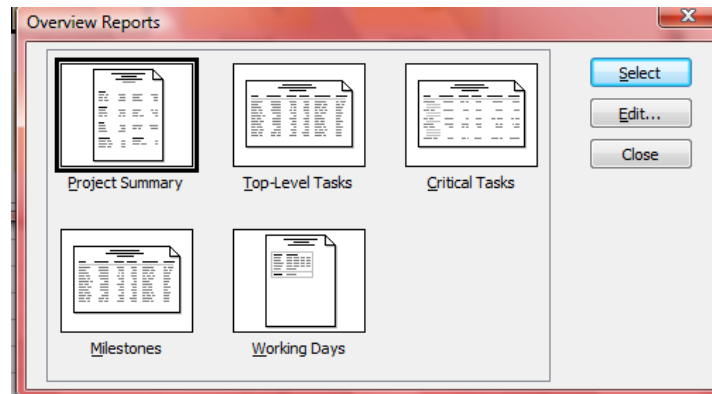


On the Project tab click Reports to display the Reports dialog box:

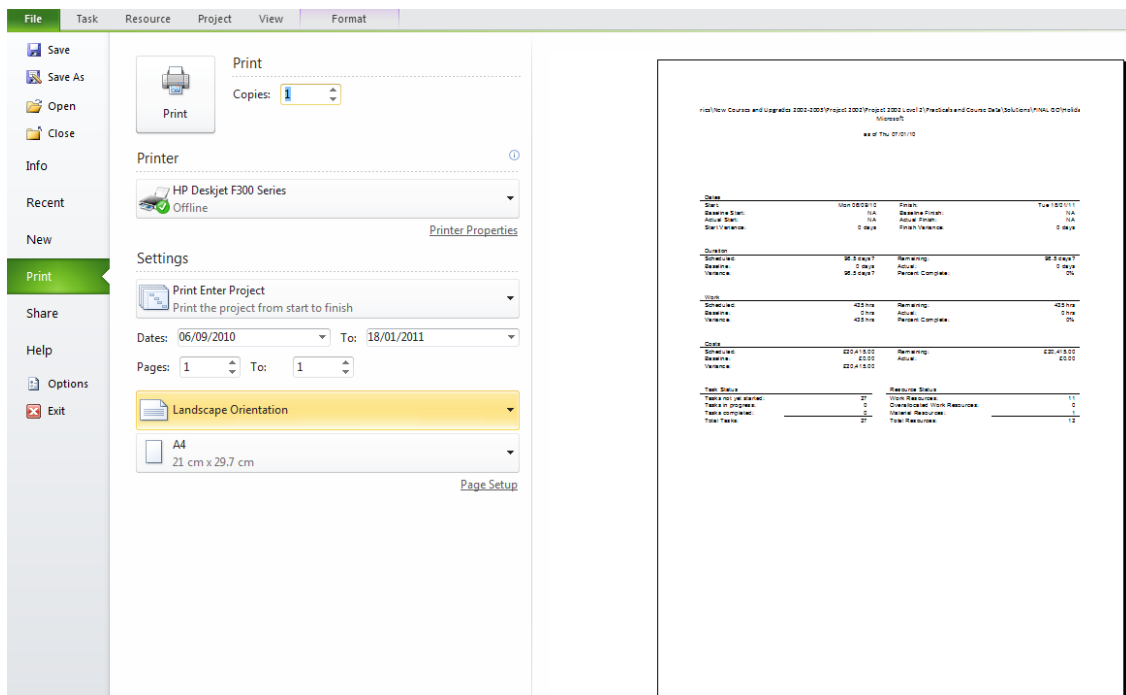


- | | |
|----------------------------|--|
| Overview: | Summarises the most significant project information, including numbers of tasks and resources, task and schedule status, costs, start and finish dates, and so on. |
| Current Activities: | Displays information about top-level tasks for the entire project. Includes summary tasks and task notes. |
| Costs: | Shows critical tasks for the entire project. Includes summary and successor tasks and task notes. |
| Assignments: | Shows project milestones. Includes summary tasks and task notes. |
| Workload: | Shows working and nonworking times for resources for the entire project duration. |
| Custom: | Create a new report. |

Double click the required category to see the available reports, for example:



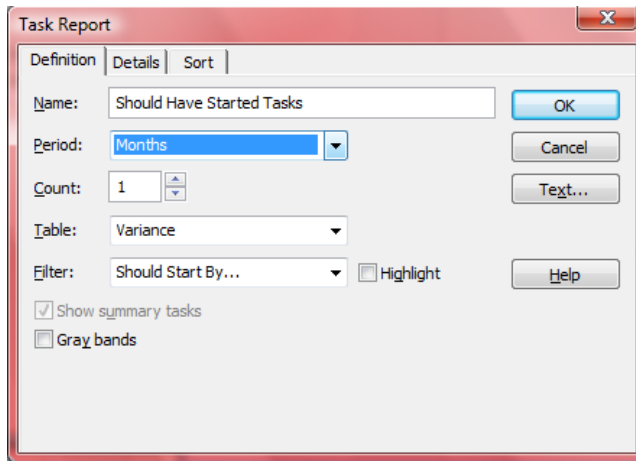
Double click a report to see it displayed in the new print preview screen:



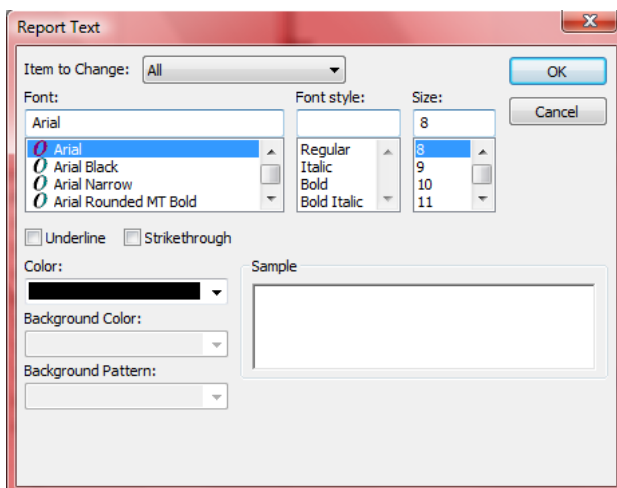
Editing Reports

You can edit any of the existing reports and change the filter or detail of information displayed:

1. On the Project tab of the ribbon, click Reports
2. Double click the required report category
3. Select a report and click Edit: the options you see depends on the report you have chosen:



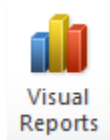
With the **Should Have Started Tasks** report you can change the period, the table and the filter.



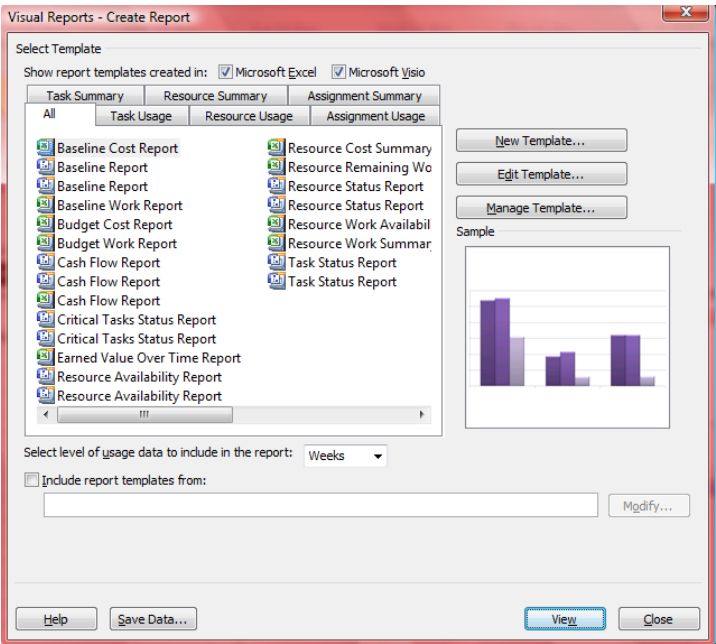
With the **Working Days** report you can only change the text formatting.

Visual Reports

Visual reports enable you to view your project's data in PivotTable reports in Microsoft Office Excel, and PivotDiagram views in Microsoft Office Visio Professional 2007.



On the Project tab click the Visual Reports command to display the Visual Reports dialog box:



The report templates are divided into six categories:

Task Usage category

Name	Type	Description
Cash Flow Report	Excel	Use this report to view a bar graph with cost and cumulative cost amounts illustrated over time.
Earned Value Over Time Report	Excel	Use this report to view a chart that plots AC (actual cost of work performed), planned value (budgeted cost of work scheduled), and earned value (budgeted cost of work performed) over time.

Resource Usage category

Name	Type	Description
Cash Flow Report	Visio	Use this report to view a diagram that shows planned and actual costs for your project over time. Costs are broken down by resource type (work, material, and cost). An indicator shows if planned costs exceed baseline costs.
Resource Availability Report	Visio	Use this report to view a diagram that shows the work and remaining availability for your project's resources, broken down by resource type (work, material, and cost). A red flag is displayed next to each resource that is overallocated.
Resource Cost Summary Report	Excel	Use this report to view a pie chart that illustrates the division of resource cost between the three resource types: cost, material, and work.
Resource Work Availability Report	Excel	Use this report to view a bar graph with total capacity, work, and remaining availability for work resources illustrated over time.
Resource Work Summary Report	Excel	Use this report to view a bar graph with total resource capacity, work, remaining availability, and actual work illustrated in work units.

Assignment Usage category

Name	Type	Description
Baseline Cost Report	Excel	Use this report to view a bar graph with baseline cost, planned cost, and actual cost for your project illustrated across tasks.
Baseline Report	Visio	Use this report to view a diagram of your project broken down by quarter, then by task. This report compares planned work and cost to baseline work and cost. Indicators are used to show when planned work exceeds baseline work, and when planned cost exceeds baseline cost.
Baseline Work Report	Excel	Use this report to view a bar graph with baseline work, planned work, and actual work for your project illustrated across tasks.
Budget Cost Report	Excel	Use this report to view a bar graph with budget cost, baseline cost, planned cost, and actual cost illustrated over time.
Budget Work Report	Excel	Use this report to view a bar graph with budget work, baseline work, planned work, and actual work illustrated over time.

Task, Resource, and Assignment Summary categories

Category	Name	Type	Description
Task Summary	Critical Tasks	Visio	Use this report to view a diagram showing the work and remaining work for both critical and non-critical tasks. The data bar indicates the percent

	Status Report		of work complete.
Task Summary	Task Status Report	Visio	Use this report to view a diagram of the work and percent of work complete for tasks in your project, with symbols indicating when baseline work exceeds work, when baseline work equals work, and when work exceeds baseline work. The data bar indicates the percent of work complete.
Resource Summary	Resource Remaining Work Report	Excel	Use this report to view a bar graph with remaining work and actual work for each work resource, illustrated in work units.
Assignment Summary	Resource Status Report	Visio	Use this report to view a diagram of the work and cost values for each of your project's resources. The percent of work complete is indicated by the shading in each of the boxes on the diagram. The shading gets darker as the resource nears completion of the assigned work.

Create a visual report by using a template

1. Select the report
2. Click View to generate the report and display it in Excel or Visio.

What You Can Print

Project Overview

To Print	Use
The number of tasks and resources, the project cost, the total amount of work, and the project start and finish dates.	Project Summary report (Overview reports)
A list of the highest-level summary tasks showing the scheduled start and finish dates, the percentage completed the cost, and the work.	Top-Level Tasks report (Overview reports)
A list of project phases (summary tasks) and durations and a Gantt bar chart showing summary tasks.	Gantt Chart view, Entry table, and Summary tasks filter
A list of milestone tasks sorted by start date.	Milestones report (Overview reports)
Working and non-working time in your schedule.	Working Days report (Overview reports)

Task Information

To Print	Use
A list of tasks and durations and a Gantt bar chart showing tasks, durations, task relationships, and assigned resources.	Gantt Chart view, Entry table
Scheduled tasks in a calendar format.	Calendar view
A list of tasks showing assigned resources and the amount of work assigned to each resource per week.	Task Usage report (Workload reports).
A list of tasks showing start and finish dates and assigned resources.	Task Sheet view, Entry table
A list of critical tasks showing the scheduled start and finish dates and the predecessors and successors of each task.	Critical Tasks report (Overview reports).
A flow chart, or network diagram, showing all tasks and task relationships.	Network diagram view.

Cost information

To print	Use
A summary of resource costs.	Resource Sheet view, Cost table
Cost information broken down by task and resource over time.	Crosstab report with tasks selected under Row, Cost selected under Column, and With Resource Assignments selected in Crosstab Report dialog box.
A list of planned and actual resource costs.	Resource sheet view and Cost table.
The cost of each task per week, along with the total cost of all tasks per week and the total cost of each task.	Weekly Cash Flow report (Cost reports).
A list of resources whose costs are going to exceed the baseline cost.	Overbudget Resources report (Cost reports).
A graph showing cumulative cost per resource over the life of the project.	Resource Graph view with Cumulative Cost chosen from Details submenu on Format menu.
A list of tasks showing whether you are ahead of or behind schedule as compared with the actual costs incurred.	Earned Value report (Cost reports).
A list of tasks showing the budgeted cost of each task and the variance between budgeted costs and current costs.	Budget report (Cost reports).
A list of tasks whose costs are going to exceed the baseline cost.	Overbudget Tasks report (Cost reports).

◆ Information about resource usage

To print	Use
A list showing detailed work information for each resource.	Resource Sheet view, Work Table
A list of resources showing the tasks to which each resource is assigned and the amount of work assigned to each resource per week.	Resource report (Assignment reports).
A list of resources showing their assigned tasks, the work scheduled for each task, the start and finish dates, and additional resource information.	Who Does What report (Assignment reports).
A list of resources showing their assigned tasks and the daily work scheduled for each task.	Who Does What report (Assignment reports).
A list showing resource use over time, along with the cost, the work, and the pay rate of each resource.	Resource Usage view, Summary table.
A graph showing the amount of work assigned to each resource over time.	Resource Graph view.
A resource's tasks, broken down by week.	Weekly To-Do List report (Assignment reports).
A list of over allocated resources and the tasks to which they are assigned.	Over allocated Resources report (Assignment reports).

Information that shows progress

To print	Use
A list of tasks that are currently in progress showing the months in which each task occurs.	Tasks In Progress report (Current Activity reports).
A list of tasks showing the actual start and finish dates, the percentage of each task completed, and the actual and remaining task durations.	Gantt Chart view, Tracking table.
A list of tasks starting within a time period that you specify.	Tasks Starting Soon report (Current Activity reports).
A list of tasks that haven't started.	Un-started Tasks report (Current Activity reports).
A list of tasks that should have started by the date you specify.	Should Have Started Tasks report (Current Activity reports).
A list of tasks showing the scheduled start and finish dates, the baseline start and finish dates, and the difference between scheduled and baseline dates.	Task Sheet view, Variance table
A list of the tasks that have been rescheduled to occur after their baseline start dates.	Slipping Tasks report (Current Activity reports).
A list of completed tasks.	Task Sheet view, Entry table, and Completed Tasks filter.
A list of completed tasks showing the months in which each task occurred	Completed Tasks report (Current Activity reports).

Reports by Report Type

To Print	Use
The number of tasks and resources, the project cost, the total amount of work, and the project start and finish dates.	Project Summary report (Overview reports)
A list of the highest-level summary tasks showing the scheduled start and finish dates, the percentage completed the cost, and the work.	Top-Level Tasks report (Overview reports)
A list of milestone tasks sorted by start date.	Milestones report (Overview reports)
Working and non-working time in your schedule.	Working Days report (Overview reports)
A list of critical tasks showing the scheduled start and finish dates and the predecessors and successors of each task.	Critical Tasks report (Overview reports).
The cost of each task per week, along with the total cost of all tasks per week and the total cost of each task.	Weekly Cash Flow report (Cost reports).
A list of resources whose costs are going to exceed the baseline cost.	Overbudget Resources report (Cost reports).
A list of tasks showing whether you are ahead of or behind schedule as compared with the actual costs incurred.	Earned Value report (Cost reports).
A list of tasks showing the budgeted cost of each task and the variance between budgeted costs and current costs.	Budget report (Cost reports).
A list of tasks whose costs are going to exceed the baseline cost.	Overbudget Tasks report (Cost reports).
A list of project phases (summary tasks) and durations and a Gantt bar chart showing summary tasks.	Gantt Chart view, Entry table, and Summary tasks filter
A list of tasks and durations and a Gantt bar chart showing tasks, durations, task relationships, and assigned resources.	Gantt Chart view, Entry table, and all tasks displayed
A list of tasks showing the actual start and finish dates, the percentage of each task completed, and the actual and remaining task durations.	Gantt Chart view, Tracking table, and all tasks displayed

To Print	Use
Scheduled tasks in a calendar format.	Calendar view
A list of tasks showing start and finish dates and assigned resources.	Task Sheet view, Entry table, with all tasks displayed
A flow chart, or network diagram, showing all tasks and task relationships.	Network diagram view.
A graph showing cumulative cost per resource over the life of the project.	Resource Graph view with Cumulative Cost chosen from Details submenu on Format menu.
A list of resources showing the tasks to which each resource is assigned and the amount of work assigned to each resource per week.	Resource report (Assignment reports).
A list of resources showing their assigned tasks, the work scheduled for each task, the start and finish dates, and additional resource information.	Who Does What report (Assignment reports).
A list of resources showing their assigned tasks and the daily work scheduled for each task.	Who Does What report (Assignment reports).
A resource's tasks, broken down by week.	Weekly To-Do List report (Assignment reports).
A list of over-allocated resources and the tasks to which they are assigned.	Over-allocated Resources report (Assignment reports).
A list showing detailed work information for each resource.	Resource Sheet view, Work Table, filter for a specific resource if required.
A list showing resource use over time, along with the cost, the work, and the pay rate of each resource.	Resource Usage view, Summary table, filter for a specific resource if required.
A graph showing the amount of work assigned to each resource over time.	Resource Graph view

To Print	Use
A summary of resource costs.	Resource Sheet view, Cost table and filter for a specific resource if required.

A list of tasks showing assigned resources and the amount of work assigned to each resource per week.	Task Usage report (Workload reports).
Cost information broken down by task and resource over time.	Crosstab report with tasks selected under Row, Cost selected under Column, and With Resource Assignments selected in Crosstab Report dialog box.
A list of planned and actual resource costs.	Resource sheet view and Cost table.

A list of tasks that are currently in progress showing the months in which each task occurs.	Tasks In Progress report (Current Activity reports).
A list of tasks starting within a time period that you specify.	Tasks Starting Soon report (Current Activity reports).
A list of tasks that haven't started.	Un-started Tasks report (Current Activity reports).
A list of tasks that should have started by the date you specify.	Should Have Started Tasks report (Current Activity reports).
A list of the tasks that have been rescheduled to occur after their baseline start dates.	Slipping Tasks report (Current Activity reports).
A list of completed tasks showing the months in which each task occurred	Completed Tasks report (Current Activity reports).

A list of tasks showing the scheduled start and finish dates, the baseline start and finish dates, and the difference between scheduled and baseline dates.	Task Sheet view, Variance table. Filter for specific tasks if required.
A list of completed tasks.	Task Sheet view, Entry table, and Completed Tasks filter.

Module 8: Multiple Projects and Resource Sharing

Objectives

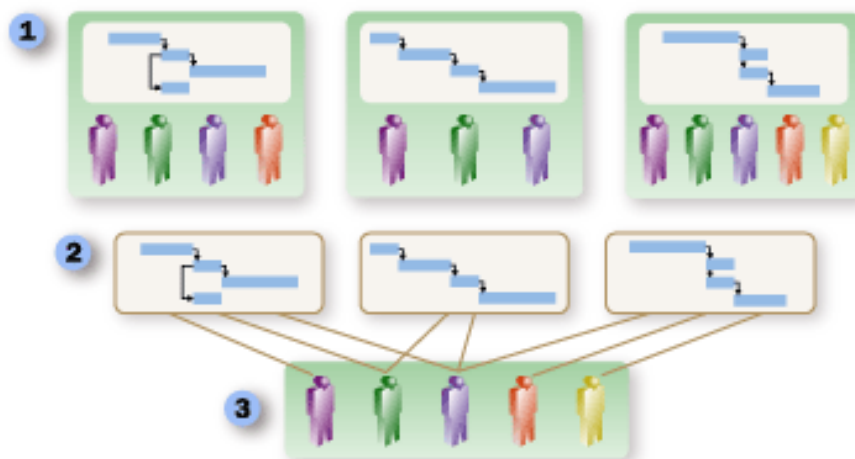
At the end of this module you will be able to:

- Create a Resource Pool
- Share Resources from a Resource Pool
- Consolidate projects into a master project
- Use the Compare Projects tool.

The Resource Pool

If you have resources that need to be allocated to more than one project at a time, you can combine all of the resource information into a single file called a resource pool.

You will then be able to schedule the work of resources across multiple projects, identify conflicts between their assignments in different projects, and see how their time is allocated in each project.



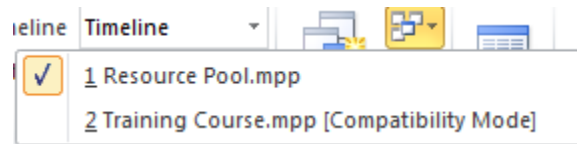
- 1** Before a resource pool is created, each project contains its own resource information. Some of this information may overlap or even conflict with information about the same resources used in other projects.
- 2** After a shared resource pool is created, the resource information in each project comes from the single resource pool. Assignment information, as well as cost rates and availability for all resources reside in one central location.
- 3** It is also easier to see resource overallocations caused by conflicting assignments in more than one project.

Each project that uses resources from the resource pool is called a sharer file. You can use any other existing project file as a resource pool, but it is recommended that you create a new project file just for resource information to make it easiest to manage resource information and task assignments between sharer files and the resource pool.

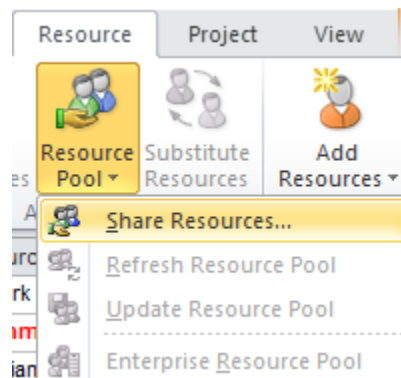
So, essentially, a resource pool is a separate project file that contains no tasks.

Exercise: Create a resource pool from an existing project and share the resources

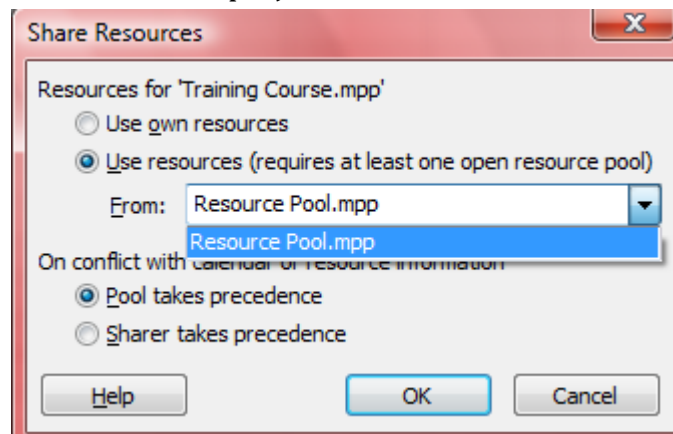
1. When creating a Resource Pool from existing projects, you will need to open each project that contains the resources you want to combine into a new resource pool. In this exercise, open from your course data folder **6 - Training Course.MPP**
2. Create a new Project and save it with the name **Resource Pool**
3. Use the Switch Window command on the View to tab to display the Training Course project



4. On the Resource tab, click Resource Pool, and then click **Share Resources**.



5. In the Share Resources dialog box, click Use resources, and then in the From box, click the Resource Pool project.



(Note: The projects must be the same version () to do this)

6. Open the Brochure.mpp project

7. View the Resource Sheet and note there are no resources entered.
8. On the Resource tab, click Resource Pool, and then click Share Resources.
9. In the Share Resources dialog box, click Use resources, and then in the From box, click the Resource Pool project.
10. In the Gantt Chart view, use the Assign Resources dialog box to assign:
11. Jamie Price to Task 2 Design Brochure Layout
12. Julian Cook to Task 3 Create Graphics
13. Note that in the Resource Usage view, even though you have not allocated Nick Pavey to any tasks in this project, you can see that he is allocated to the Slide Development task (in the Training Course project):

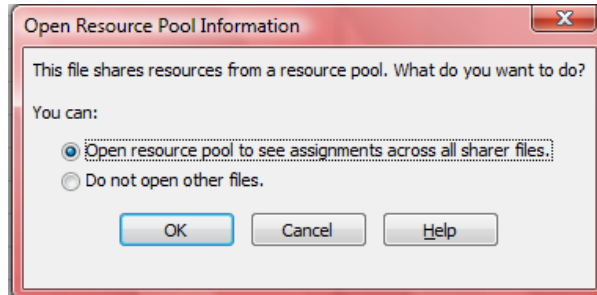
<input type="checkbox"/> Nick Pavey	40 hrs	Work		8h	8h			8h
<input checked="" type="checkbox"/> Slide Development	40 hrs	Work		8h	8h			8h
<input checked="" type="checkbox"/> Richard Buller	1 hr	Work						
<input type="checkbox"/> Jamie Price	16 hrs	Work						
<input checked="" type="checkbox"/> Design Brochure Layout	16 hrs	Work						

14. Save and close all the projects.

Updating the Resource Pool

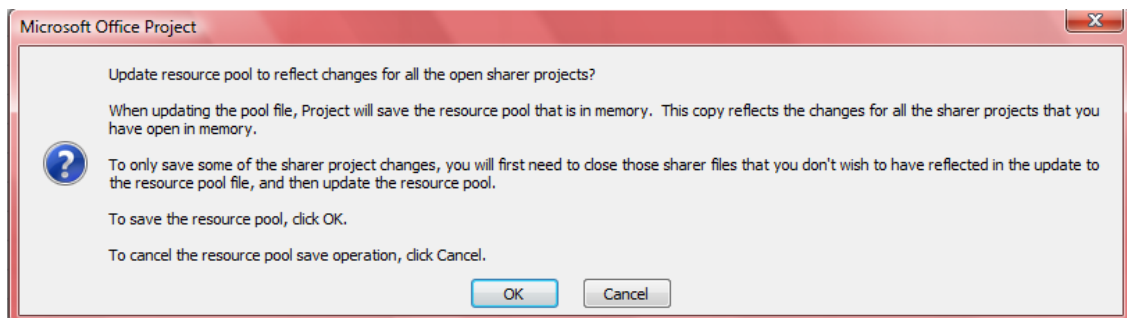
Review and update assignments

When you open a project that has shared resources you will see the following dialog box:



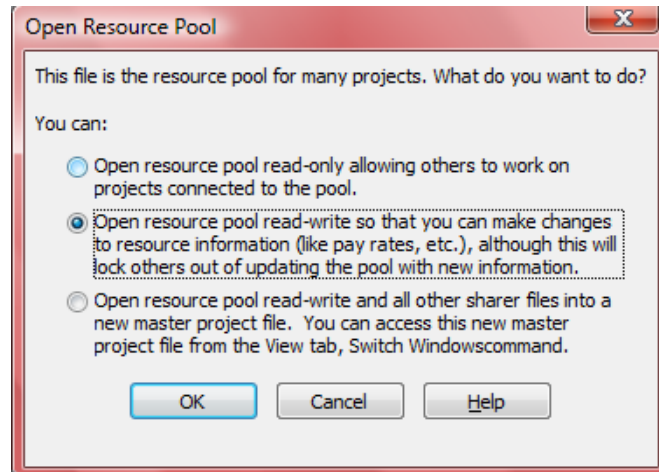
If you want to resource assignments across all shared files, choose the first option. In the Resource Usage view you will see all the tasks that the resource is allocated to from all the separate projects.

If you make changes to the resource assignments, when you save the project you are prompted to also save the Resource Pool:



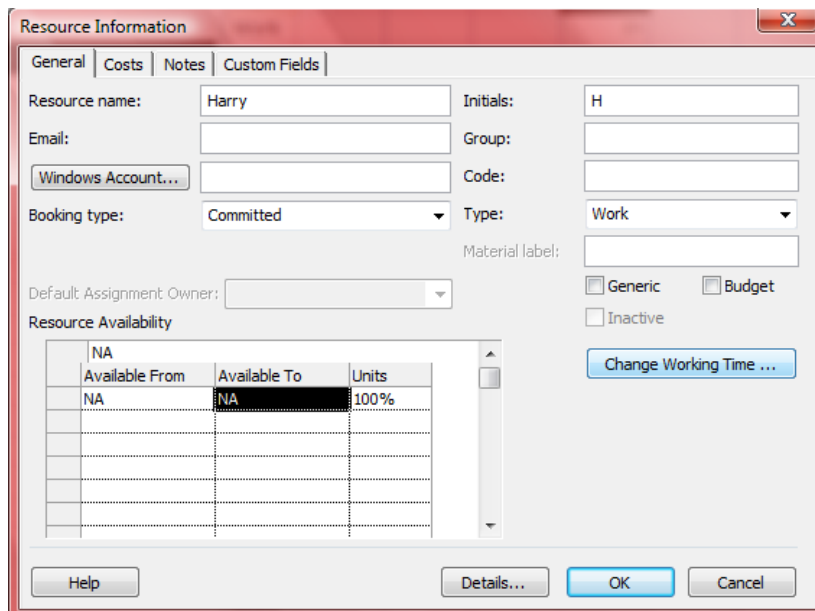
Update resource availability or cost information

If you need to update resource costs or resource availability, open the resource pool file shared by the projects in read-write mode:



Other users can only open the resource pool file **read-only** while you are working.

In the Resource Sheet you can change the resource costs – double click a resource to display the Resource Information dialog box where you can the working time:



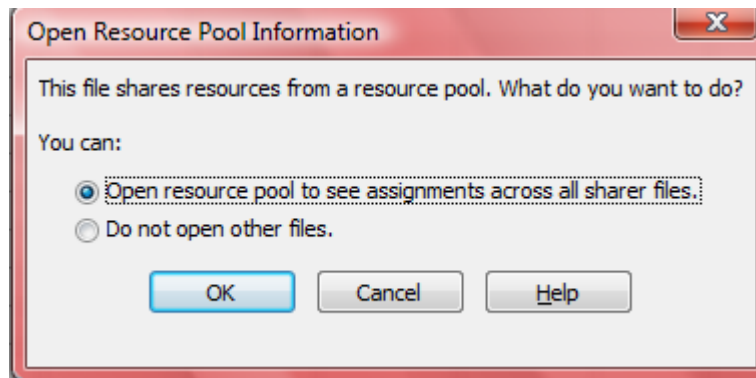
Tip: if want to update assignments across all the shared projects, chose the third option in the Open Resource Pool dialog box. This will create a new master project file - you will be able update all files you've authored. Other users will be able to

work in the sharer files at the same time and they will see updated information as you work.

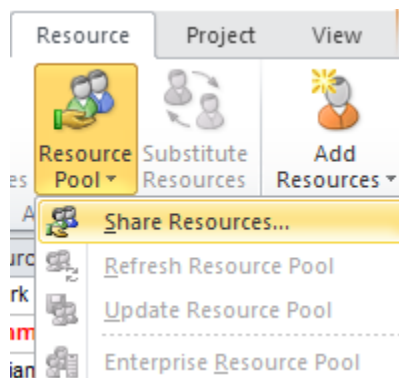
Stop sharing resources (temporarily)

If your project shares resources from a resource pool or from another project file, you can temporarily disconnect it. You will then see just the resources that are assigned in this project.

1. Open the project file that contains the resources you are sharing.
2. In the Open Resource Pool dialog box, select the first option to Open resource pool to see assignments across all sharer files.



3. With your project active, on the Resource tab, click Resource Pool, and then click **Share Resources**.

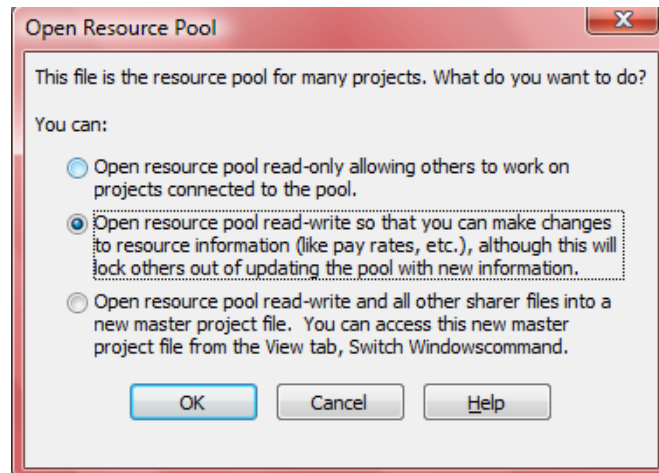


4. In the Share Resources dialog box, click Use resources, and then in the From box, Click Use own resources and then click OK.
5. Close all project files and save the changes.
6. Re-open your project – you will no longer be prompted to open the Resource Pool.

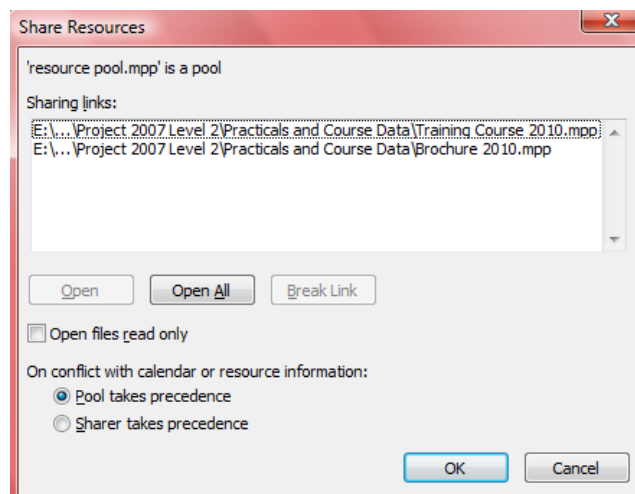
Stop sharing resources from a Resource Pool (permanently)

'Permanently' is meant in the sense that you no longer wish to use/share resources from the Resource Pool and wish to actually disconnect project(s) from the Resource Pool.

1. Open the resource pool file.
2. In the Open Resource Pool dialog box, click the second option



3. On the Resource tab, click Resource Pool, and then click Share Resources:



4. To disconnect a file, select the file or files, and then click Break Link

Note: Projects with tasks assigned to resources from the resource pool retain those assignments (but later changes will not be updated in the resource pool). Those projects you disconnect no longer have available other resources from the resource pool.

5. Save and close all project files.

Consolidating projects

A consolidated project (also known as a master project) contains one or more inserted projects (known as subprojects). The inserted projects can retain links to their source projects so that any changes in the consolidated project are also made in the source files. The inserted projects may be linked to one another to create dependencies.

You can create a consolidated project by inserting copies of individual projects at any outline level into a single project file. With a consolidated project, you can view, print, and change information for all the projects you're working with (and even those projects "owned" by other project managers) as though they were a single project.

When to use a master project and subprojects

Creating a master project and subprojects allows you to break down a large project and delegate its parts to the appropriate people. In project management terms, assigning subprojects in this way gives responsibility to those who do the work and matches authority with accountability. In Microsoft Project terms, creating subprojects within a master project helps individual project managers gain access and control over their parts of the schedule.

To determine if you should break up a large project into a master project and subprojects, ask the following questions:

- Is the project very large and detailed? If your project will contain more than a few hundred tasks, it may be difficult to navigate and manipulate as one large file. Breaking it into subprojects can keep it more manageable because you can view each subproject individually. If some parts of the project contain work that is broken down into more detail than others, it may make sense to make those parts into separate subprojects so that most users will see only a rolled up description of the subproject, but interested parties can view it in more detail if they choose. A single file will almost always be the faster alternative, but the ability to focus on just a part of the project may be worth the trade off.
- What is the corporate culture? In a decentralised or distributed environment, a master project and subprojects give workers greater control over their own work than one centralised project file does.
- Does your company do top-down or bottom-up planning? If lower-level managers are responsible for and know which tasks are needed on the project, it may make more sense to allow them to plan their work and

then consolidate their project files in a master project. If top-down planning is the norm, you may want to reorganise the initial plan into subprojects when it is implemented so that individual project managers or teams have access to and control over their own schedules.

- Are you working on multiple projects? Project managers may have a set of projects they work with all the time, whether the projects are interrelated or not. Instead of opening them one by one, all the subprojects are opened at once when the master project is opened. This approach also makes it easy to generate reports on multiple projects quickly. If the projects are interrelated, the project manager can create task dependencies between tasks in different projects. Creating dependencies between projects makes it easier for different project managers to see how work by other project managers affects their schedules.
- Are some projects subordinate to other projects? You can accurately reflect the hierarchy of multiple projects by inserting various projects into other files. The resulting structure of subprojects should reflect the priorities and responsibilities of your team members as well as the interrelationships between tasks in different areas and the overall deadline.
- Is your project modified by several people? Ideally, one file is owned, managed, and modified by one project manager. But often a project is part of a larger program that upper-level managers may need to manage. If you have such a project, your team can retain focus on their work by viewing it as a separate file. And the project manager who controls the master project can coordinate each subproject team's schedule. It may even make sense to have the master project's milestones drive each subproject team's milestones in order to keep the schedules coordinated for a deadline. (Coordinating the milestones can be done by creating a dependency between the milestones or by copying and pasting the milestone tasks from the master project to each subproject.)
- Are there multiple stakeholders who care about different parts of the project? When people want to look at different details, project managers can put all the project files on a server and customise different views for various stakeholders. The same project file can be used as a subproject in different master projects to tailor the information displayed.
- Do you want the subprojects to be read-only? You can retain additional control over parts of a project by moving tasks to a subproject and restricting access to key people.
- Do you want to analyse the critical path for each phase as well as the overall project? Each individual project contains a critical path. Consolidating multiple projects into one master project file makes it easy

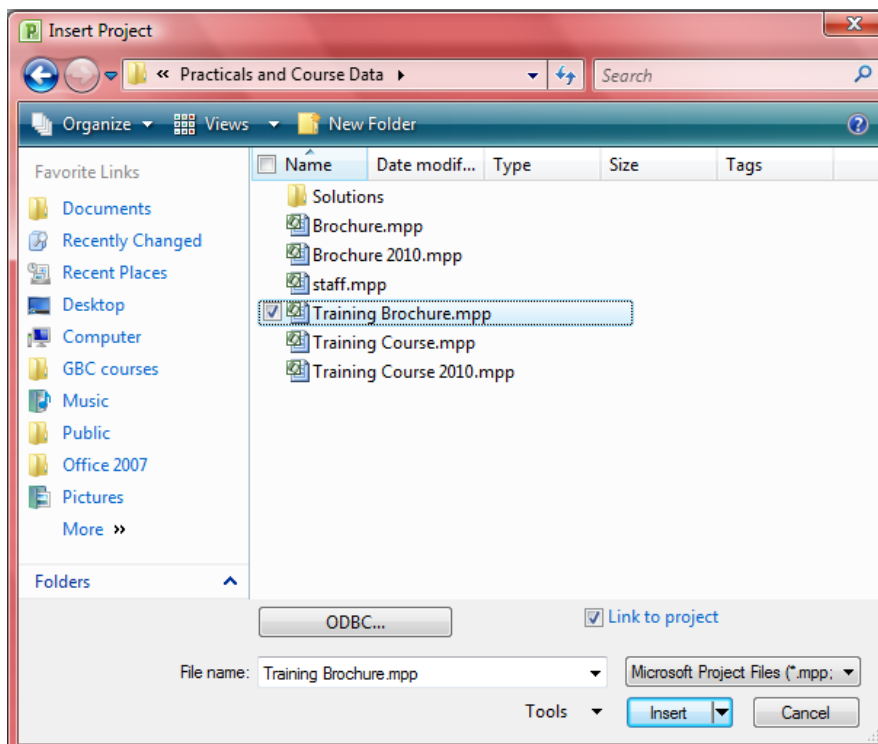
to see the overall picture as multiple critical paths in the master project while retaining separate critical paths for each subproject.

Insert subprojects into a master project

1. Open the project that you want to become a master project – or create a new project.
2. In the Task Name field, click the row below where you want to insert the project.












3. On the Project tab click Sub Project **Subproject**
4. Navigate to the drive/folder of the required project
5. Select the project and click Insert.



Tips

- To insert multiple projects, hold down CTRL and click the projects in the order that you want to insert them.
- By default the sub project is linked – meaning any changes you make in the master file will also be made in the individual project – you can uncheck the Link to project option.
- To insert a project in read-only format, click the arrow on the Insert button, and then click Insert Read-Only.

- After you've inserted a subproject, you can show a subproject's hidden subtasks by clicking the subtask's outline symbol, the plus sign that appears before the subproject's name:

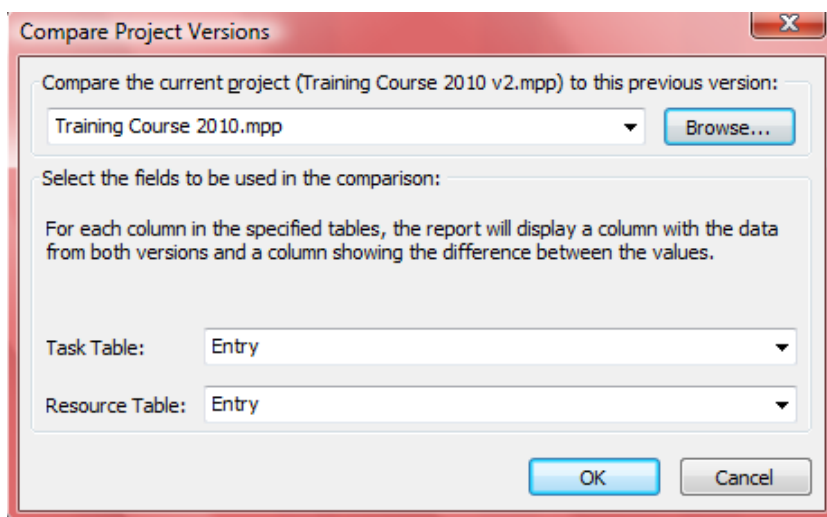
	Task Mode ▾	Task Name ▾	Duration ▾
		+ Training Course 2010	17 days
		- Brochure 2010	20 days?
		Meeting with Graphics	0 days?
		Design Brochure Layout	2 days
		Produce Graphics	3 days
		Modify Graphics	1 day

- When consolidating projects into a master project, resources remain in the individual projects. You cannot assign a resource from one subproject to another subproject.

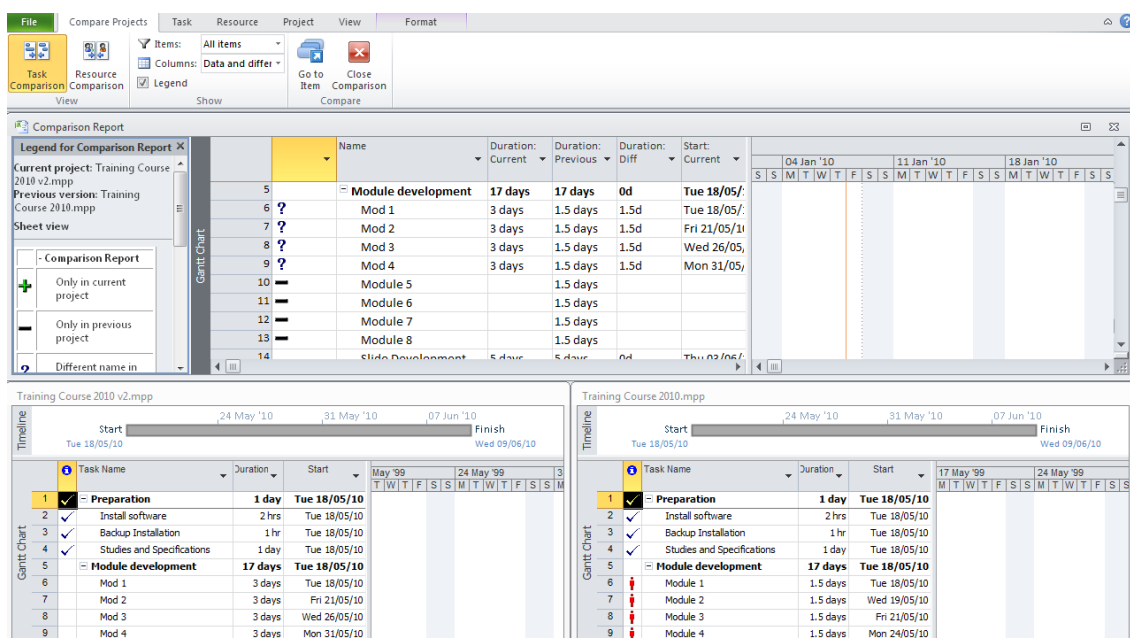
Compare Project Versions

If you have two versions of a project and would like to find out exactly what changed from one version to the next, open them both in Microsoft Project and compare them, using the following steps:

1. In Microsoft Project, open the latest version of your project
2. On the Project tab of the ribbon, click the Compare Project command and browse to select the previous version of the project.
3. Select the required Task Table and Resource Table from the drop down lists or choose the default Entry tables.



4. Click **OK**. A temporary project is created and the Compare Projects tab is visible:



Note: The legend explains the colour coding and indicators used:

Legend for Comparison Report

Current project: Training Course 2010 v2.mpp
Previous version: Training Course 2010.mpp
Sheet view

	- Comparison Report
+	Only in current project
-	Only in previous project
?	Different name in previous version
	Common to both versions

Gantt Chart

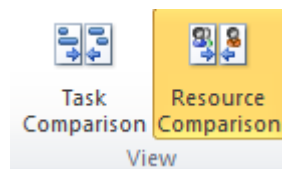
Current project:

Summary	
Task	
Milestone	

Previous version:

Summary	
Task	
Milestone	

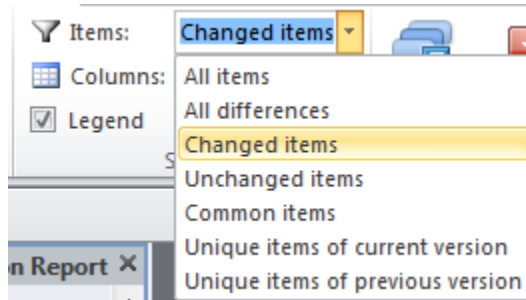
On the ribbon, choose Resource Comparison to see any differences between the Resource Sheets of the two projects:



Note: the tool compares the list of tasks and resources, but it does not compare assignment information.

Notes:

- The Compare Projects tab includes the option to filter the information



- When you are viewing the comparison report, the two projects being compared are displayed in the bottom of the screen – these are live versions of the project in which you can make changes if you require.
- You can save the Comparison Report so that you can refer to it later – it is not a proper project with Gantt Bars and assignments, but simply a list of the difference between the two compared projects.

E&OE

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