Microsoft Project 2010 Baseline Mgmt. & Data Tracking

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Installing the Sample Files

Our sample files are available for you to download from the Internet onto your own computer. Each course has a set of sample files which have been compressed into a single, executable file with the extension ".exe". You will need to download the file from the Internet and extract the sample files into their folder before they can be opened by the appropriate application.

1. Launch Internet Explorer or your Web Browser and go to the following website:

   www.fullcirclecomputing.com/samplefiles.htm

2. You will find a table listing our courses by application and level. Locate the course you intend to practice, and click on the hyperlink.

3. Click the **Open** button to begin the download of the file to a temporary folder. The download may take a few minutes to complete.

4. Now an Extract dialog box will appear. Notice the location the file will be extracted to. You might want to write this down so you will know where to find it later.

5. Click the **Extract** button. If asked, click **Yes** to create a new directory. The extract may take a few minutes to complete.

6. Click **OK** when completed.

7. You will now be back to the sample files table. Close the Internet Explorer window.

Launch the application you are planning to practice. You will now be able to open the sample files normally from the location you extracted to in step 4 above.

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LESSON 1 -
REVIEWING PROJECT BASICS

In this lesson, you will learn how to:

- Change project information
- Enter tasks
- Edit tasks
- Enter a milestone task
- Enter a recurring task
- Edit recurring tasks
- Indent and outdent tasks
- Insert a task
- Delete a task
- Move a task
- Link tasks
- Unlink tasks
- Enter a start or finish date

EXERCISE

REVIEWING PROJECT BASICS

Task

Practice using project basics.

1. Create a new blank project.
2. Define a new project and enter a start date of **6/19/06**.
3. Save the project to the student data folder as **Rooms1**.
4. Designate **November 23rd** and **24th** in the year **2006** as nonworking days. (***Hint:*** *Drag or hold* ***[Ctrl]*** *to select both dates.)*
5. Enter the following tasks in the first available fields in the **Task Name** column:

Task Name	**Duration**
Create Plan	2 days
Plan Approval	6 days
Get Permits	1 day
Paint Board Room	3 days
Lay Carpets in Board Room	3 days (estimate)
Trim Board Room	2 days

6. Enter a milestone task in the next empty field in the **Task Name** column with the name **Board Room Complete**.
7. Enter the following recurring task in the next empty field:

Task Name	Report Progress
Duration	1 hour
Frequency	Weekly, Tuesday and Thursday

8. View the subtasks for the **Report Progress** recurring task.
9. Change the duration of the **Report Progress 1** subtask to two hours and change the start date to **Wed**, **6/21/06**.
10. Change the recurring task frequency for the **Report Progress** task from Tuesday and Thursday to Monday and Thursday.

11. Insert the **Renovate Board Room** task above the **4 Paint Board Room** task. Make the **5 Paint Board Room** to the **8 Board Room Complete** tasks subtasks of the **Renovate Board Room** task.
12. Move the **6 Lay Carpets in Board Room** task below the **7 Trim Board Room** task.
13. Link the **1 Create Plan** through **8 Board Room Complete** tasks.
14. Enter a day of lag time between the **6 Trim Board Room** task and the **7 Lay Carpets in Board Room** task.
15. Insert the **Install Board Room Furniture** task above the **8 Board Room Complete** task.
16. The movers are coming on July 17th to install the Board Room furniture. Enter a start date of **7/17/06** for the **8 Install Board Room Furniture** task and keep the link.
17. Save and close the project.

LESSON 2 -
WORKING WITH CALENDARS

In this lesson, you will learn how to:

- Use calendars
- Modify individual resource calendars
- Modify a calendar
- Change resource availability over time
- Create a base calendar
- Assign a base calendar to resources
- Assign a base calendar to a project
- Assign a calendar to a task

USING CALENDARS

Discussion

When you first start a project, the **Standard** base calendar is applied to the project and is referred to as the project calendar. This calendar sets Monday through Friday, from 8:00 AM to 5:00 PM, as working time, and Saturday and Sunday as nonworking time. When you begin to enter task and resource information, your project schedule is set according to the default project calendar.

The default working and nonworking times in the **Standard** calendar may not apply to your particular project. While Microsoft Project also provides two other base calendars, **Night Shift** and **24 Hours**, these may not work for your project either. In this situation, you can create a new base calendar, containing the working and nonworking times specific to your project, and then apply it to the project, thus creating a new project calendar. If you need to create a new project calendar, you should do so before entering any project information.

If you find that the **Standard** calendar works for your project, with the exception of certain resources, you have two options. You can modify an individual resource calendar by setting working hours and nonworking time specific to a particular resource. You can also create a new base calendar and assign it to all resources that adhere to the same schedule. Either way, you create a new resource calendar. You can modify resource calendar options and create a new resource calendar before you assign resources to tasks or after making the assignments. If resources are already assigned to tasks, the schedule will adjust according to the new resource calendar settings. Modifying resource calendar options is particularly helpful for marking vacation time on the calendar. Resource calendars do not apply to material resources.

You can also create a resource calendar by changing a resource's availability over time. When you change a resource's availability, you indicate the maximum units available during certain time periods. That way, tasks are scheduled according to when the resource is available. For example, you could change a resource's availability if the resource is available to work part-time (units = 50%) in July and August and full-time (units = 100%) in September and October.

Task information is also scheduled according to the **Standard** project calendar by default. However, if you have tasks that must be worked on during certain hours or days of the week, you can create a task calendar. To create a task calendar, you create a new base calendar to reflect the task's schedule and then assign it to the appropriate task(s).

MODIFYING INDIVIDUAL RESOURCE CALENDARS

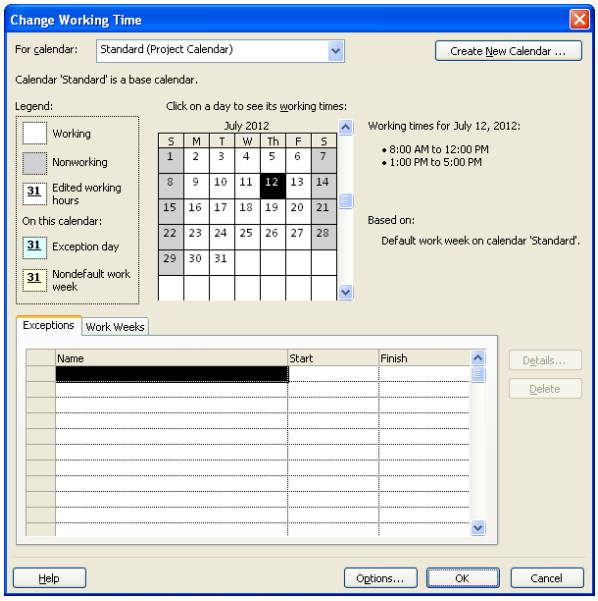
Discussion

When you create a new resource, Microsoft Project creates a calendar for the resource based on the project calendar. However, all resources in your project may not work during the same hours as the default working times set in the project calendar. Some resources may only work four hours a day and some may work ten hours a day. In addition, some resources may be taking a vacation or only work three days a week; therefore, the default nonworking time would not apply. Changing the working and nonworking time for a resource is very important as it will affect your project schedule.

The **Change Working Time** dialog box allows you to change the working hours for a resource and mark nonworking days. When you change the working hours for a resource, you need to make sure that the start time is not earlier than the default start time (8:00 AM by default or the default time set by you). The finish time (5:00 PM by default or the default time set by you), however, can be later than the default finish time. You can change the working time for a day, week, month, etc.

Use the **Exceptions** tab to set occasional changes to the normal working times, such as holidays, personal time off, vacations, and so on. Use the **Work Weeks** tab to set up the normal work week for a resource. For example, if a resource does not work on Fridays, use the **Work Weeks** tab to change every Friday to a nonworking day. Also use the **Work Weeks** tab to set up alternate or temporary work weeks. For example, you can specify that a resource will be working an extended work week for a rush job, or a reduced work week throughout August.

By default, the **Standard** project calendar defines the nonworking days for a project as Saturday and Sunday. Once you create resources, you can mark nonworking days for individual resources.



Modifying an individual resource calendar

To mark multiple days in the same calendar as nonworking time or change the working hours for those days, drag to select consecutive days before you name the **Exception**. If adjusting **Work Weeks**, you can select consecutive days or hold the **[Ctrl]** key and click the desired non-consecutive days after you click the **Details** button.

If you change a resource's start time to a time earlier than the task start time (either the default or the one set by you), Microsoft Project will ignore the work hours before the task start time and the task duration will be impacted.

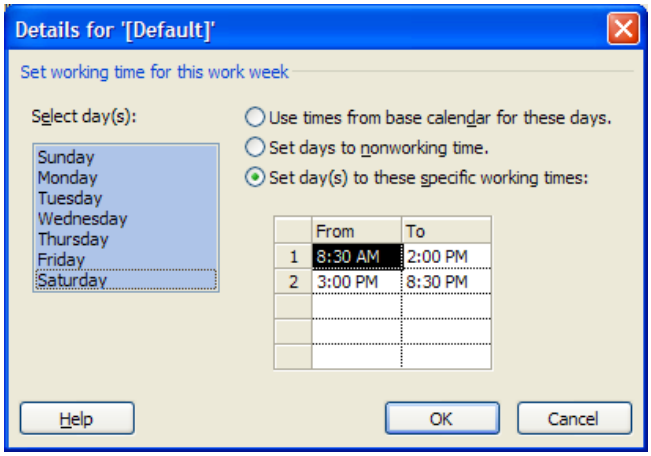
Step-by-Step

From the Student Data directory, open **HOUSE7.MPP**.
Modify a calendar for an individual resource.

In the **Gantt Chart** view, scroll to the week of **Jul 23, '06**.

Notice that the **Superintendent** resource is scheduled to work on the **8 Select Subcontractors** task, which has a duration of one week. Point to the Gantt bar for the task and view the start and finish dates to see that the task is scheduled from Monday through Friday for five working days.

Steps	***Practice Data***
1. Switch to the **Resource Sheet** view and double-click the resource with the calendar you want to change. *The Resource Information dialog box opens.*	Double-click the **17 Superintendent** resource
2. Select the **General** tab. *The **General** page appears.*	Click the **General** tab
3. Select **Change Working Time**. *The dialog box appears.*	Click the **Change Working Time** button
4. Select the date(s) or day(s) of the week that you want to change. *The date(s) are selected.*	Click on any day in the week of 7/23
5. If setting nondefault working hours, select the **Work Weeks** tab. *The Details for [Default] working time dialog box appears.*	Click the **Work Weeks** tab, and click the **Details** button
6. Select the day(s) you want to change working time for. *The day(s) of the week are selected.*	Highlight Sunday through Saturday
7. Select the **Use times from base calendar**, **Set days to nonworking time**, or **Set days to specific working times** option as desired. *The desired option is selected.*	Click ○ **Set day(s) to these specific working times:**
8. Set the time you want to change in the **From** and **To** column. *The desired time is selected.*	Click in the first **From** box and type **8:30 AM**, and continue entering times as shown in the diagram below
9. Select OK. *The dialog box closes and the working hours for the resource have changed.*	Click **OK**



Modifying default working time for an individual resource

Switch to the **Gantt Chart** view. Point to the task bar for the **Select Subcontractors** task and notice that the task, while still showing a duration of one week, is scheduled from Monday through Thursday for a total of four business days. The scheduling change occurred because the **Superintendent** works more than eight hours a day.

Practice the Concept: Scroll to view the **4 Request Bids** task and point to the Gantt bar for the task to see that it starts on **6/23/06** and finishes on **6/29/06**, with a duration of **1 week**. Notice that the task duration includes two days marked as nonworking time (**June 24 and 25**). Switch to the **Resource Sheet** view and open the Resource Information dialog box for the **6 Contracting Specialist** resource. From the **Change Working Time** dialog box, scroll to view the **June 2006** calendar and mark **June 28**, **29**, and **30** as nonworking time. Select the desired dates and from the Exceptions tab, enter the Name "**CS Vacation**". Click to the Start date to populate the dates. Click **Details** and select ○ **Nonworking**. Then click **OK** to close the dialog box and apply the changes.

Switch to the **Gantt Chart** view and point to the Gantt bar for the **4 Request Bids** task again. Notice that the task now finishes on **7/6/06**. The schedule was adjusted since the nonworking time of the resource occurred during the time the resource was scheduled to work on the task.

SETTING RESOURCE-SPECIFIC WORK HOURS

Discussion

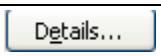
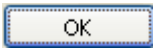
This example leads you through the steps to select a base calendar template, and set the working days and starting and ending times for the resource. Although the base calendar template defines the holidays and standard nonworking days such as Saturday and Sunday, you can select additional nonworking days for the resource using the Change Working Times dialog box.

Step-by-Step

Setting Resource-specific work schedules.

In the **Gantt Chart** view, select the **25 Initial Electricity** task and scroll to view the Gantt bar for the task. Notice that the **Electrician** resource is scheduled to work on the task, which has a duration of two weeks. Point to the Gantt bar and view the start and finish dates to see that the task is scheduled from **Tuesday 9/26/06** through **Monday 10/9/06** for ten working days.

The electricians do not work on Fridays, but work two extra hours from Monday to Thursday to make up the time.

Steps	***Practice Data***
1. Click the **Project** tab on the ribbon.	Click the **Project** tab
2. Click the **Change Working Time** button	Click 
3. Select the resource whose calendar you want to create. *The selected resource appears under the **For Calendar** text box*	Click **3 Electrician**
4. Select the **Work Weeks** tab..	Click the **Work Weeks** tab
5. Then click the details button to open the details dialog box.	Click 
6. Select or deselect the days of the week the resource will or will not work from the Select Days list on the left.	Click **Friday** then click ○**Set Days to Nonworking Time**
7. Click OK to accept the change.	Click 
8. Click the details button again to reopen the details dialog and adjust the working times for all days or individual days as needed.	Click and drag to select **Monday** through **Thursday**
9. Choose the option to override the standard work schedule hours	○**Set Day(s) to these specific working times**

Steps	*Practice Data*
10. Enter the new scheduled working times	Change the working hours so that the electricians finish at 7 PM
11. Click OK to accept the change.	Click OK

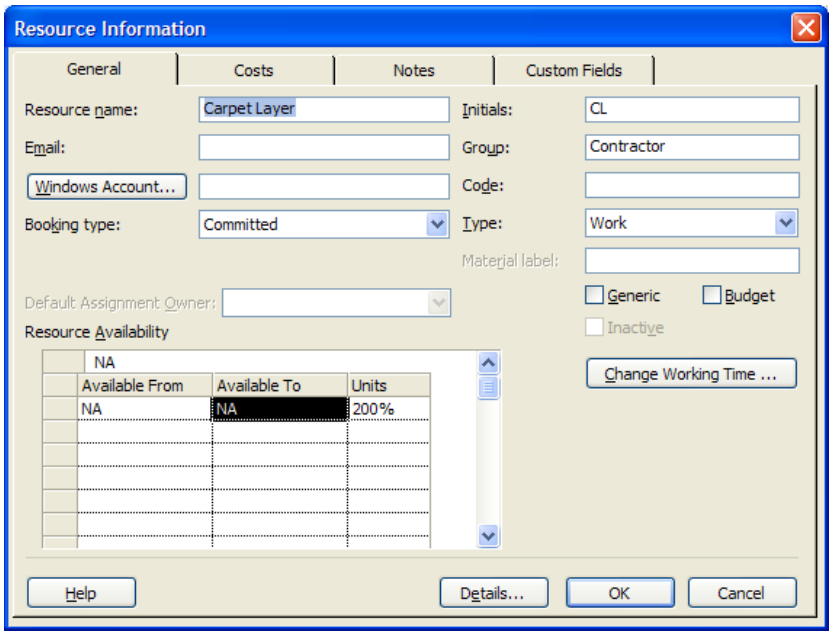
Switch to the **Gantt Chart** view. Scroll down to the **25 Initial Electricity** task and point to the task bar. Notice that the starting and ending dates have remained the same. The **Electrician** resource is still working 40 hours per week; instead of five 8-hour days, the resource is now working four 10-hour days.

CHANGING RESOURCE AVAILABILITY OVER TIME

Discussion

In addition to changing a resource's working and nonworking time, you can also create a resource calendar by changing a resource's availability over time. When you change availability, you indicate the maximum units available for a resource during certain time periods. For example, a project starts September 1 and ends on November 30. A particular resource is available to work on the project, but only during the months of September and October. You could change the resource's availability to indicate that the resource is available (units = 100%) during those two months, and not available (units = 0%) during the month of November. Then, if you attempt to assign that resource to a task in November, the resource will be identified as overallocated. In most resource views, overallocations appear in red.

After you change a resource's availability, the **Max. Units** field in the resource sheet reflects 0%. This occurs since the maximum unit value varies over time and one value does not apply to this particular resource. To view the resource's availability, you can open the Resource Information dialog box for the resource and view availability on the **General** page.



Changing a resource's availability over time

Step-by-Step

Change a resource's availability over time.

Switch to the **Resource Sheet** view. Notice that **200%** appears in the **Max. Units** field for the **4 Plumber** resource.

Steps	***Practice Data***
1. Double-click the resource for which you want to change the availability. *The Resource Information dialog box opens.*	Double-click the **4 Plumber** resource
2. Select the **General** tab. *The **General** page appears.*	Click the **General** tab
3. Select the first **Available From** field in **Resource Availability** table. *The first **Available From** field is selected and a down arrow appears.*	Click in the first **Available From** field
4. Type the start date for the first time period. *The date appears in the **Available From** field and in the entry bar under **Resource Availability**.*	Type ***9/1/06***

Steps	***Practice Data***
5. Press **[Enter]**. *The date is entered into the **Available From** field.*	Press **[Enter]**
6. Enter the end date for the first time period in the **Available To** field. *The desired date appears in the **Available To** field.*	Click in the first **Available To** field, type **10/31/06**, and press **[Enter]**.
7. Select the **Units** field. *The **Units** field is selected.*	Click in the first **Units** field
8. Enter the units available for the resource during the specified time frame. *The units appear in the **Units** field.*	Click **Units** to **200%**, if necessary
9. Continue to specify the resource's availability as necessary. *The resource's availability is entered.*	Follow the instructions shown below the table before continuing on
10. Select **OK**. *The Resource Information dialog box closes and the resource's availability is changed.*	Click **OK**

Use the information in the second row of the following table to complete the second row of the **Resource Availability** table:

Available From	**Available To**	**Units**
9/1/2006	10/31/2006	200%
11/1/06	12/31/06	100%

Return to the table and continue on to the next step (step 10).

Notice that the **Max. Units** field for the **Plumber** resource reflects **0%**, indicating that the resource availability varies over time.

Switch to the **Gantt Chart** view and display the Gantt bar for the **33 Final Plumbing** task. Notice that the **Plumber** resource is assigned to the task. Point to the task bar and notice that the task begins on 11/6/06. Select the **Final Plumbing** task, open the Assign Resources dialog box, and increase the maximum units for the **Plumber** resource to **200%**. Press **[Enter]** and close the Assign Resources dialog box. Notice that a smart tag appears next to the **33 Final Plumbing** task. Since the Microsoft Project took the default action for adding a resource and shortened the duration, you can ignore the smart tag.

Switch to the **Resource Sheet** view and notice that the **Plumber** resource appears in red, indicating it is overallocated. This overallocation occurred because the assignment unit is 200% during a time when the plumber's availability is 100%.

Return to the **Gantt Chart** view, double-click the **33 Final Plumbing** task and use the **Resources** page in the Task Information dialog box to return the resource assignment of the **Plumber** to **100%**. Ignore the smart tag to accept the default action, which increases the duration of the task.

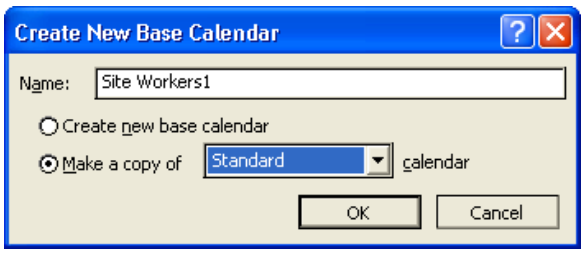
CREATING A BASE CALENDAR

Discussion

A base calendar defines working and nonworking time. Microsoft Project includes three base calendars (**Standard**, **24 Hours**, and **Night Shift**) that you can assign to your project, resources, and/or tasks. The **Standard** base calendar is assigned to the project by default.

If none of the default base calendars meets your needs, you can create a new base calendar for a particular group of resources, a task, or for the entire project. Once you create a base calendar, you then need to assign it to the appropriate resource(s), task(s), and/or to the project.

You can create a base calendar in one of two ways. The first way is to copy the project calendar, or one of the other default calendars available, and then modify it. Copying the project (**Standard**) calendar is helpful if you have already marked all the holidays on your project calendar. The second way is to create a new base calendar using the default settings (8:00 AM to 5:00 PM working hours; Saturday and Sunday nonworking days).



The Create New Base Calendar dialog box

Step-by-Step

Create a base calendar.

Steps	***Practice Data***
1. Select the **Project** Tab if necessary	Click the **Project** tab
2. Select the **Change Working Time** command. *The dialog box opens.*	
3. *The **Create New Base Calendar** dialog box opens with the text in the **Name** box selected.*	Click the **Create New Calendar...** button
4. Enter the name of the new base calendar. *The name appears in the **Name** box.*	Type ***Site Workers1***
5. Select the **Create new base calendar** or **Make a copy of** ***<calendar name>*** **calendar** option. *The desired option is selected.*	Click ○ **Make a copy of** ***<calendar name>*** **calendar**, if necessary
6. Select the desired calendar from the **calendar** list, if appropriate. *A list of available calendars appears; select the desired calendar.*	Click **Standard** from the ***<calendar name>*** ▼
7. Select **OK**. *The dialog box closes.*	Click **OK**
8. Modify the new base calendar as desired. *The base calendar is modified.*	Scroll to view the calendar for **August 2006** and select **August 21-25**
9. Modify the new base calendar as desired. *The base calendar is modified.*	On the **Exceptions** tab, click the next blank line and type **Vacation** in the name. Then click in the **Start Date** to populate the dates
10. Modify the new base calendar as desired. *The base calendar is modified.*	Click the **Details** button to mark **August 21-25** as nonworking time
11. Select **OK**. *The dialog box closes and the changes to the base calendar are saved.*	Click **OK**

Practice the Concept: Create a new base calendar called **Landscaping**. Base the calendar on the **Standard** calendar. Add **Saturday** as a working day and save the calendar. Open the **Change Working Time** dialog box and display the **Landscaping** calendar. Select any Saturday and notice that it is set to the default working times. Cancel the **Change Working Time** dialog box.

Switch to **Gantt Chart** view.

ASSIGNING A BASE CALENDAR TO RESOURCES

Discussion

You may have a group of resources that have schedules different from the rest of the resources in a project. Instead of individually editing the resource calendar for each resource involved, you can create a new base calendar reflecting the group's schedule and name it accordingly. When you change the working hours for a group, the same guidelines apply as when you change the working and nonworking time for an individual resource.

After you create a base calendar for a group of resources that share a common work schedule, you need to assign the calendar to those resources. When you assign a calendar in the Resource Information dialog box, the working hours do not change until you close the dialog box. You can open the Resource Information dialog box again to see that the working hours displayed match the base calendar you assigned to the resource. In addition, you can only assign a base calendar to one resource at a time.

> You can also use the **Base Calendar** field in the **Resource Sheet** view to assign a base calendar.

Step-by-Step

Assign a base calendar to resources.

If necessary, switch to the **Gantt Chart** view.

Scroll as necessary to view the task bar for the **16 Frame House** task. Point to the Gantt bar to view the end date for the task and notice that it is scheduled to end on **Fri 8/25/06**. Switch to the **Resource Sheet** view.

Steps	*Practice Data*
1. Double-click the resource to which you want to assign a new base calendar. *The Resource Information dialog box opens.*	Double-click the **9 Carpenter** resource
2. Select the **Change Working Time** button. *The dialog box appears.*	Click the **Change Working Time** button
3. Select the **Base calendar** list. *A list of available base calendars appears.*	Click **Base calendar**
4. Select the desired base calendar. *The selected base calendar appears in the **Base calendar** box.*	Click **Site Workers1**
5. Select **OK**. *The Resource Information dialog box closes and the base calendar is assigned to the resource.*	Click **OK**

Scroll to the right as necessary to view the **Base Calendar** field for the resource.

Practice the Concept: Assign the **Site Workers1** base calendar to the **1 Laborer** resource.

Switch to the **Gantt Chart** view and point to the task bar for the **16 Frame House** task again. Notice that the **Frame House** task, to which the **Carpenter** resource is assigned, is now scheduled to end on **Fri 9/1/06**. The change occurred since the week of **August 21-25, 2006** is nonworking time on the **Site Workers1** base calendar.

ASSIGNING A BASE CALENDAR TO A PROJECT

Discussion

If the default project calendar does not meet the needs of your project, you can create a new project calendar. To create a new project calendar, you need to create a base calendar to reflect working and nonworking time specific to your project. Then, you need to assign the new base calendar to your project using the Project Information dialog box.

If you need to use a new project calendar, you should do so before you enter project information.

Step-by-Step

Assign a base calendar to a project.

Steps	*Practice Data*
1. Select the **Project** tab. *The **Project** ribbon appears.*	Click the **Project** tab
2. Select the **Project Information** command. *The dialog box opens.*	Click **Project Information...**
3. Select the **Calendar** list. *A list of available calendars appears.*	Click **Calendar**
4. Select the calendar you want to assign to the project. *The selected calendar appears in the **Calendar** box.*	Click **Site Workers1**
5. Select **OK**. *The dialog box closes and the base calendar is assigned to the project.*	Click **OK**

Open the Change Working Time dialog box and notice that **Site Workers1 (Project Calendar)** appears in the **For** box. Cancel the dialog box.

Practice the Concept: Open the Project Information dialog box and change the project calendar back to the **Standard** calendar.

ASSIGNING A CALENDAR TO A TASK

Discussion

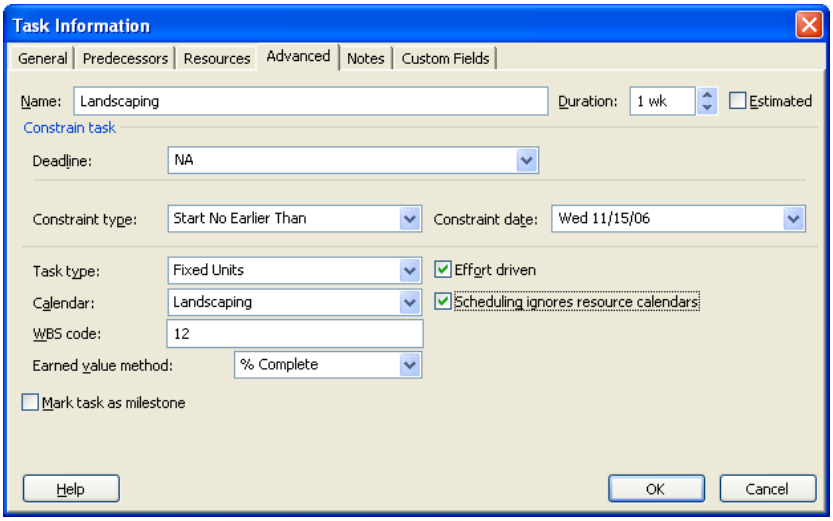
You may have certain tasks that need to be worked on during hours that are different from the default project calendar. You can create a task calendar for these tasks by creating a new base calendar and then assigning that calendar to the appropriate tasks.

When you assign a calendar in the Task Information dialog box, the working hours do not change until you close the dialog box. You can open the Task Information dialog box again to see that the working hours displayed match the base calendar you assigned to the task. You can assign a task calendar to one task or to multiple tasks at the same time.

If resources are assigned to the task to which you assign a task calendar, the task is scheduled during the working times that are common to both calendars. If there are conflicting times, the resource calendar takes precedence. However, if you want the

task completed according to the task calendar, you can open the Task Information dialog box and select the **Scheduling ignores resource calendars** option. When you select this option, the resource calendar is ignored and the task is scheduled according to the task calendar. Therefore, the resource only works during the hours specified by the task calendar.

You can quickly see which tasks have a task calendar assigned to them by looking for the **Task Calendar** indicator in the **Indicators** field in a task view. When you point to the indicator, the ScreenTip identifies the calendar assigned to the task and indicates if the calendar is set to ignore the resource calendar.



Assigning a calendar to a task

> You can assign a task calendar to multiple tasks using the Multiple Task Information dialog box. After selecting the tasks, press Shift+F2 to open this dialog box.

Step-by-Step

Assign a base calendar to a task.

If necessary, switch to the **Gantt Chart** view.

Scroll as necessary to view the task bar for the **38 Landscaping** task. Point to the bar to see that the task begins on a Wednesday and ends on a Tuesday with a duration of one week.

Steps	***Practice Data***
1. Double-click the task to which you want to assign a calendar. *The Task Information dialog box opens.*	Double-click the **38 Landscaping** task
2. Select the **Advanced** tab. *The **Advanced** page appears.*	Click the **Advanced** tab
3. Select the **Calendar** list. *A list of available base calendars appears.*	Click **Calendar**
4. Select the desired calendar. *The calendar is selected.*	Click **Landscaping**
5. Select **OK**. *The Task Information dialog box closes and the calendar is assigned to the desired task.*	Click **OK**

Point to the Gantt bar for the **38 Landscaping** task again and notice that nothing changed. Even though the **Landscaping** base calendar includes Saturday as a work day, the **Landscaper** resource, which is assigned to the task, adheres to the **Standard** calendar which designates Saturday as nonworking time.

Open the Task Information dialog box again and select the **Scheduling ignores resource calendars** option on the **Advanced** page. Close the dialog box. Point to the Gantt bar for the **Landscaping** task again and notice that the task now finishes on Monday instead of Tuesday. The change occurred since the task calendar includes Saturday as working time and the resource calendar, which marks Saturday as nonworking time, is ignored.

Point to the **Task Calendar** indicator to view the ScreenTip.
Close **HOUSE7.MPP**.

LESSON 3 -
ADJUSTING RESOURCES

In this lesson, you will learn how to:

- Address resource overallocation
- View resource usage
- Resolve conflicts by increasing units
- Level a resource
- Specify leveling timeframes
- Change the leveling order
- Level by entering a delay amount
- Clear leveling
- Split a task
- Change leveling to automatic
- Set task level priority

ADDRESSING RESOURCE OVERALLOCATION

Discussion

Microsoft Project schedules tasks in accordance with their specifications, such as the estimated durations, dependency relationships, date constraints, and resource availability. Tasks are scheduled to begin in the first available time slot on the resource calendar after any relationship requirements are satisfied. Microsoft Project does not consider that a resource may already be involved in another task. For example, if an employee is assigned to do three eight-hour tasks in one eight-hour day, the employee is overallocated. For this reason, you should review workloads to uncover allocation problems after you have assigned resources.

When resource overallocation or conflicts arise, you must develop a strategy to resolve them. The following list provides ways to address overallocations:

- Increase the number of resources available, when possible. This solution, of course, is not always economically feasible.
- Add underallocated resources to the task to assist the overallocated resource. This solution is often the most satisfactory, but also requires more effort from the project manager.
- Schedule overtime hours or weekend work for the overallocated resources to get the project back on track. This solution should be used when the overallocation is not substantial.
- Change the resource calendar to reflect longer working hours.
- Adjust task relationships or constraints so that a resource is not assigned beyond its capacity.
- Delay tasks until a resource is available. Often, this solution is not viable when deadlines are involved.
- Split a task so that a resource can work on it at a later time.

Overallocated resources appear in red in most of the resource views. The **Resource Usage** view is one view in which you can clearly review resource allocation and see if any of your resources are overallocated.

> Resource amounts appear as a percentage. For example, if three plumbers are available to work full-time on any tasks, the maximum unit for the **Plumber** resource would be **300%**.

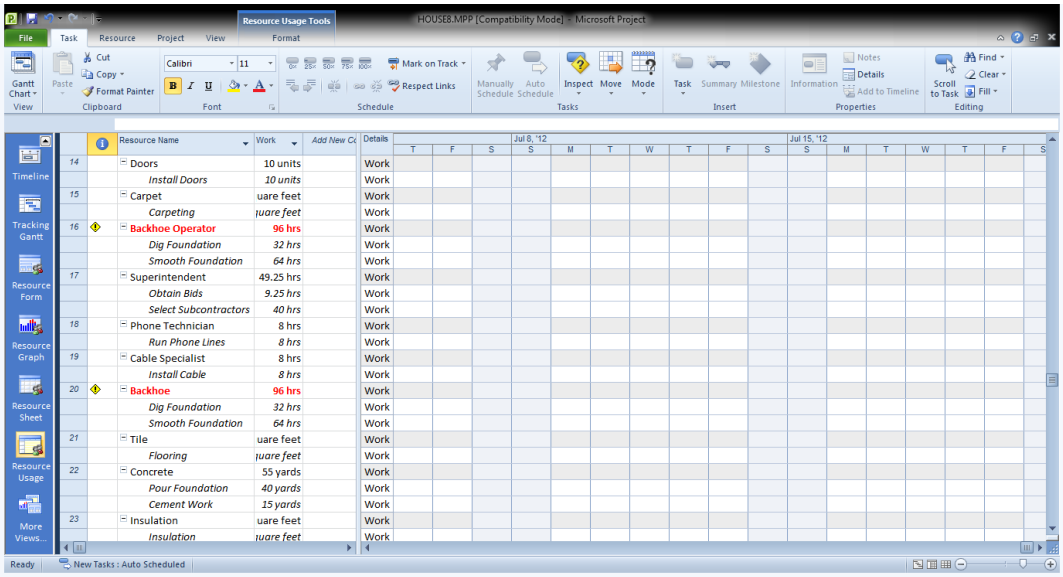
> You can display resource amounts as decimals rather than percentages using the **Show assignment units as a** list in the **Schedule** page of the Options dialog box.

VIEWING RESOURCE USAGE

Discussion

You can view resource allocation and quickly identify overallocated resources in the **Resource Usage** view. This view displays each resource name and the list of tasks to which each resource is assigned, as well as the sum of the work assignments.

By default, the **Resource Usage** view uses a timescale similar to the **Gantt Chart** view, but it shows number values instead of bars. These numbers are the scheduled amount of work for each resource for the duration of the task(s) to which they are assigned. If a resource is overallocated, the resource name and numbers appear in red. You can add fields to display the actual work already completed by the resource (**Actual Work**) and the total work accumulated for the resource (**Cumulative Work**). You can also add fields to view the amount of work for which the resource is overallocated (**Overallocation**), the cost for all tasks assigned to the resource (**Cost**), and the amount of time remaining that the resource is available (**Remaining Availability**).



The Resource Usage view

> Formatted numbers that are too wide to fit into a cell may appear as a series of pound signs (#). To view an entire number, you can increase the column width by dragging the right column border in the column heading to the desired width.

> You can also display and hide details by right-clicking in the timescale pane on the right and selecting or deselecting the desired detail.

Step-by-Step

From the Student Data directory, open **HOUSE8.MPP**.
View resource usage and overallocation details

Switch to the **Resource Usage** view. Use the vertical scroll bar as necessary to display the **16 Backhoe Operator** resource, which appears in red, indicating that it is overallocated. Select the **16 Backhoe Operator** resource.

Steps	***Practice Data***
1. Scroll the timescale to display the hourly breakdown for the desired task(s). *The hourly breakdown appears with overallocations displayed in red.*	Click  to scroll to the week of **Aug 6, ′06**
2. If necessary click the **Resource Usage Tools** contextual tab	Click the **Resource Usage Tools** contextual tab
3. Select the field you want to display. *The desired field appears in the right pane of the **Resource Usage** view.*	Click ☐ **Overallocation**

View the **T** (Tuesday) field for the week of **Aug 6, ‘06** and notice that the **Backhoe Operator** is overallocated by 16 hours.

Practice the Concept: Display the **Remaining Availability** field. Scroll as necessary to see that the **Backhoe Operator** resource is available for sixteen hours on Monday of the week of **Aug 13, ′06**.

Hide the **Remaining Availability** field by right-clicking in the right pane and deselecting the **Remaining Availability** command. Hide the **Overallocation** field as well.

RESOLVING CONFLICTS BY INCREASING UNITS

Discussion

One method of solving overallocation problems with a resource is to increase the maximum units assigned to the task, if possible. For example, if your project shows that the **Electrician** resource is overallocated during the seventh month of the project, additional electricians could be hired for that one month period.

Step-by-Step

Resolve resource conflicts by increasing units.

If necessary, switch to the **Resource Usage** view.

Scroll as necessary to view the **2 Painter** resource during the week of **Oct 22, '06**. Notice that the resource name and work values are in red, indicating that the resource is overallocated.

Steps	***Practice Data***
1. Double-click the overallocated resource to which you want to add units. *The Resource Information dialog box opens.*	Double-click the **2 Painter** resource in the **Resource Name** column
2. Select the **General** tab. *The **General** page appears.*	Click the **General** tab, if necessary
3. Select the **Units** field in the **Resource Availability** table. *The **Units** field is selected and a spin box appears in the field.*	Click in the **Units** field
4. Enter the new unit value in the **Units** field in the **Resource Availability** table.	Click **Units** to **400%**
5. Select **OK**. *The Resource Information dialog box closes and the resource no longer appears in red*	Click **OK**

Notice that the **Painter** resource no longer appears in red since you added a painter to complete the task.

LEVELING A RESOURCE

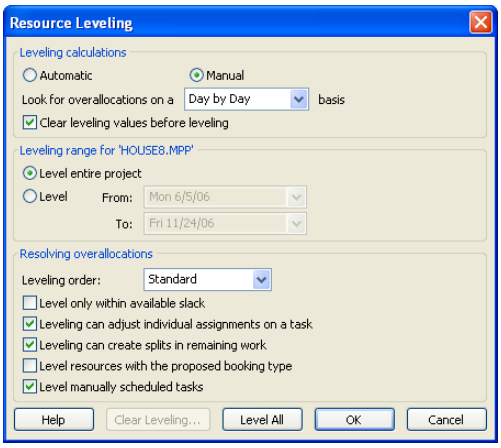
Discussion

If multiple tasks have been scheduled at the same time, resource overallocation can result. The resources can be spread out over a longer period of time or tasks can be delayed or split to lessen the demand for the resources. This process is called resource leveling, which is one way to resolve resource conflicts.

In most resource views, overallocated resources appear in red. In resource views with an indicator column, an indicator appears to let you know that a resource is overallocated and should be leveled. The indicator appears in the **Indicators** column in the shape of a yellow diamond containing a black exclamation point.

You can level one resource at a time or all project resources at once when you are in a resource view. If you are not in a resource view when you level resources, all resources are leveled and you are not prompted to choose which resources you want to level.

You can level resources manually or automatically as tasks are added to the schedule. In addition, Microsoft Project can search for overallocations in a specified time period, such as daily or weekly, so that you can level resources in a specified time frame, such as on a particular day or month. You can set leveling options to control the way in which multiple resources are leveled and specify if the project finish date is affected by leveling. You can also set options to control the leveling of multiple resources assigned to the same task and to allow tasks to be split.



The Resource Leveling dialog box

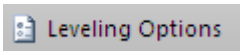
> If you try to level a resource and leveling is not an option, a Microsoft Project dialog box will open, informing you of any problems and providing alternatives to leveling.

Step-by-Step

Level a resource.

If necessary, switch to the **Resource Usage** view.

Scroll as necessary and notice that the **9 Carpenter** resource appears in red with a leveling indicator to its left, indicating that it is overallocated.

Steps	***Practice Data***
1. Select the resource(s) you want to level if you are only leveling selected resources. *The desired resource is selected.*	Click the **9 Carpenter** resource in the **Resource Name** column
2. Select the **Resource** tab. *The **Resource** ribbon appears.*	Click the **Resource** tab
3. Verify that the **Manual** option is selected under **Leveling calculations**.	Click  and verify ○ **Manual** is selected
4. Select the **Level Resources** button. *The Resource is leveled according to the options set*	Click 

Notice that the **Carpenter** resource no longer appears in red and that the leveling indicator disappeared.

SPECIFYING LEVELING TIMEFRAMES

Discussion

When you level resources, you can use the default time settings or specify your own. By default, Microsoft Project looks for overallocations on a **Day by Day** basis; meaning that if a resource is overallocated, Microsoft Project will level the resource only if the assigned tasks cannot be completed in one day. Therefore, if the resource is assigned two tasks on the same day and one requires two hours and the other requires three hours, the resource will not be leveled. On the other hand, if both tasks require six hours, the resource will be leveled. You can change the time period in which Microsoft Project looks for overallocations to **Minute by Minute**, **Hour by Hour**, **Week by Week**, or **Month by Month**.

In addition, by default, Microsoft Project levels an entire project unless you indicate otherwise. You can specify a timeframe in which you want Microsoft Project to level resources. Therefore, if your project lasts six months, you can set Microsoft Project to only level overallocated resources in a particular month or week, on a specific day, etc.

Step-by-Step

Specify leveling timeframes.

Switch to the **Resource Sheet** view. Notice that both the **16 Backhoe Operator** and **20 Backhoe** resources appear in red, indicating that they are overallocated. Switch to the **Gantt Chart** view and scroll to view the week of **Aug 6, '06**. Notice that both resources are assigned to two tasks (**12 Dig Foundation** and **13 Smooth Foundation**) that overlap.

Steps	***Practice Data***
1. Select the **Resource** tab. *The **Resource** ribbon appears.*	Click the **Resource** tab
2. Verify that the **Manual** option is selected under **Leveling calculations**.	Click Leveling Options and verify ○ **Manual** is selected
3. Select the **Look for overallocations on a <*timeframe*> basis** list. *A list of timeframe options appears.*	Click **Look for overallocations on a <*timeframe*>** ▼ **basis**
4. Select the desired time period. *The desired timeframe appears in the **Look for overallocations on a <timeframe> basis** box.*	Click **Month by Month**
5. Select the desired option under **Leveling range for '*file name*'**. *The desired option is selected.*	Click ○ **Level**
6. Select the **From** list. *A calendar appears.*	Click **From** ▼
7. Select the desired date. *The desired date appears in the **From** box.*	Enter From**: 8/6/2006** To: **8/13/2006**
8. Click OK to accept the changes.	Click OK

Steps	*Practice Data*
10. Select **Level Now**. *The Resource Leveling dialog box closes and the overallocated resources meeting the specified criteria are leveled.*	Click 

Notice that the two tasks still overlap. Based on the options you selected in the Resource Leveling dialog box, only tasks with more work than could be completed in a month (**Month by Month**) were leveled.

Practice the Concept: Open the **Leveling Options** dialog box again, change the time period to **Day by Day**, and select **Level Now**. Notice that the second task (**13 Smooth Foundation**) is delayed until the other task (**12 Dig Foundation**) is finished. Switch to the **Resource Sheet** view and notice that both resources no longer appear in red.

CHANGING THE LEVELING ORDER

Discussion

When Microsoft Project levels resources, it uses a set of rules to determine the order in which the tasks will be delayed. When more than one task will be delayed, you have three selections to determine the order in which the tasks are delayed. In the Resource Leveling dialog box, you can display the **Leveling order** list under **Resource overallocations** and select one of the following options: **ID Only**; **Standard**; **Priority, Standard**.

When the **ID Only** option is selected, Microsoft Project chooses the task with the higher ID number as the task to delay. The **Standard** option is the default order of leveling. With the **Standard** option, Microsoft Project uses five criteria to determine which task should be leveled first. The order of these criteria is as follows: predecessor relationships, slack, dates, priority, and constraints on the task. The **Priority, Standard** option is the same as the **Standard** option, but the order of the criteria changes. The priority is the first determining factor, followed by predecessor relationships, slack, dates, and constraints.

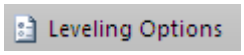
Priority refers to the level of importance you attach to a task regarding leveling. You can assign a priority level from 0 through 1000, with 1000 indicating that the task is not to be leveled. By default, all tasks are assigned a priority level of 500. Slack refers to the amount of time a task can be delayed before it impacts the dates of another task or the project finish date.

You can also set other leveling options in the **Resolving overallocations** area to control the way Microsoft Project levels resources. If you want Microsoft Project to level tasks without affecting a project's finish date, you can select the **Level only within available slack** option, which is not selected by default. However, this option

does not allow Microsoft Project much flexibility in leveling resources. If you want Microsoft Project to level overallocated resources assigned to the same tasks as other, non-overallocated resources, you can select the **Leveling can adjust individual assignments on a task** option, which is selected by default. If you want Microsoft Project to split a task so that a resource can perform the task later, you can select the **Leveling can create splits in remaining work** option, which is also selected by default.

Step-by-Step

Change the leveling order.

Steps	***Practice Data***
1. Select the **Resource** tab. *The **Resource** ribbon appears.*	Click the **Resource** tab
2. Open **Leveling Options** dialog	Click 
3. Select the **Leveling order** list under **Resolving overallocations**. *A list of delay options appears.*	Click **Leveling order** 
4. Select the desired delay option. *The desired delay option appears in the **Leveling order** box.*	Click **Priority, Standard,** then Click **OK**
5. Select **OK**. *The project is leveled utilizing the new leveling settings.*	Click 

Practice the Concept: Change the leveling order back to the default, which is **Standard**.

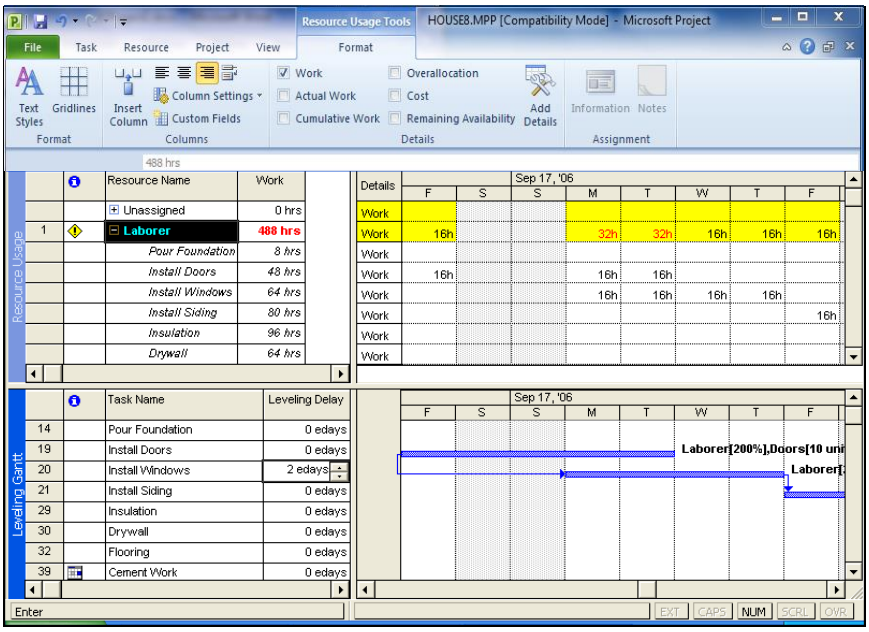
LEVELING BY ENTERING A DELAY AMOUNT

Discussion

If the source of the overallocation for a resource is because you scheduled more than one task at the same time, one or more of the tasks can be delayed in order to distribute the demand on the resource. You can view the Gantt chart to see where conflicts exist and determine the number of days you need to delay a task. You can allow Microsoft Project to delay the task when you use the Resource Leveling dialog box, or you can choose to delay the task yourself.

When you delay a task, you enter the desired delay amount in the **Resource Allocation** view. The **Resource Allocation** view is a combination view. The top pane

displays the **Resource Usage** view and the bottom pane displays the **Leveling Gantt** view. You enter the delay amount in the **Leveling Gantt** view in the **Leveling Delay** field. This field is always based on elapsed time. Therefore, if you enter a **7** in this field, a value of **7 edays** would be entered by Microsoft Project, indicating seven elapsed days. If you are using the **Standard** project calendar, seven elapsed days includes Saturday and Sunday.



The Resource Allocation view

Step-by-Step

Level a resource by entering a delay amount.

If necessary, switch to the **Resource Sheet** view and notice that the **1 Laborer** resource appears in red, indicating that it is overallocated.

Use the More Views dialog box to switch to the **Resource Allocation** view. Drag the vertical split bar to the right until the **Leveling Delay** field appears in the bottom pane. Scroll the top pane as necessary to view the **1 Laborer** resource that appears in red. Select the **Laborer** resource to display the tasks to which it is assigned in the bottom pane. Select the **19 Install Doors** task in the bottom pane and use the **Scroll to Task** button to view the task bars for the **19 Install Doors** and **20 Install Windows** tasks. Notice that the tasks overlap.

Steps	*Practice Data*
1. Select the **Leveling Delay** field in the bottom pane for the task you want to delay. *The **Leveling Delay** field for the desired task is selected and a spin box appears in the field.*	Click the **Leveling Delay** field for the **20 Install Windows** task
2. Enter the desired delay amount. *The desired amount appears in the **Leveling Delay** field.*	Type ***2***
3. Press **[Enter]**. *The delay is entered and the resource is no longer overallocated.*	Press **[Enter]**

Notice that the **Laborer** resource no longer appears in red.

CLEARING LEVELING

Discussion

There may be times when you have leveled a particular resource or an entire project and are still not satisfied with the results. You can reverse the leveling action immediately after leveling a resource using the **Undo** feature or the **Clear Leveling** button in the Resource Leveling dialog box. When you use the **Clear Leveling** button, you have the option to clear the leveling for the entire project or the selected task. In addition, you can remove a delay by entering a **0** in the **Leveling Delay** field in the **Leveling Gantt** view.

Step-by-Step

Clear leveling.

If necessary, switch to the **Resource Allocation** view and view the tasks for the **1 Laborer**.

Steps	*Practice Data*
1. Select the task associated with the leveling action you want to remove. *The desired task is selected.*	Click the **20 Install Windows** task in the bottom pane

Steps	*Practice Data*
1. Select the **Resource** tab. *The **Resource** ribbon appears.*	Click the **Resource** tab
2. Select the **Clear Leveling** command. *The Resource Leveling dialog box closes and the Clear Leveling dialog box opens.*	Click **Clear Leveling...**
3. Select the **Entire project** or **Selected tasks** option. *The desired option is selected.*	Click ○ **Selected tasks**, if necessary
4. Select **OK**. *The Clear Leveling dialog box closes and the leveling of the entire project or selected tasks is cleared.*	Click **OK**

Notice that the **1 Laborer** resource appears in red again, indicating that it is overallocated, and the delay amount for the **20 Install Windows** task changed back to **0**.

Switch to the **Resource Sheet** view.

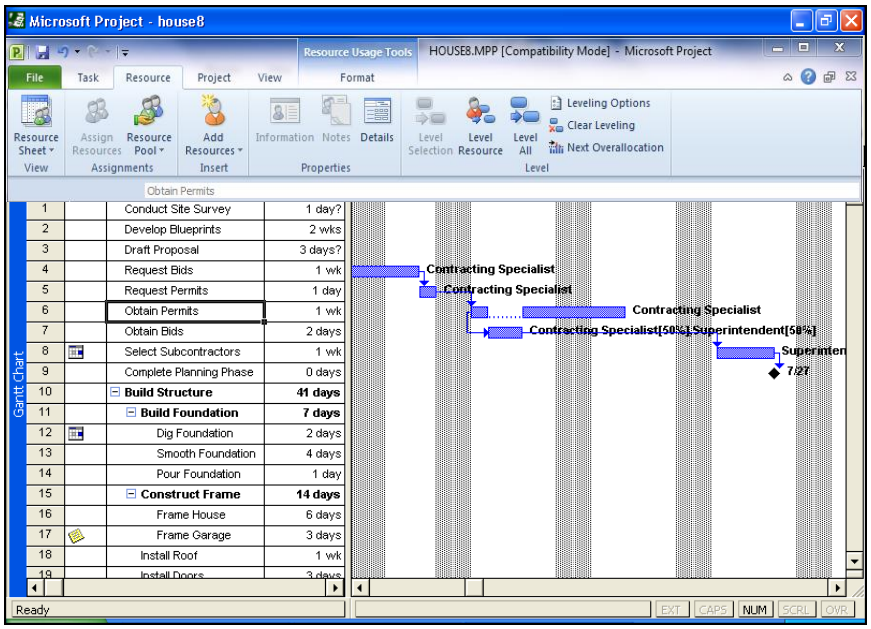
SPLITTING A TASK

Discussion

Another way that you can address overallocations is to split a task. Splitting a task is helpful when you have two tasks that overlap and use the same resource. For example, you could split the first task where the second task begins and then resume work on the first task when the second task is complete.

You may also need to split a task if part of the task occurs on one day and part on another, non-consecutive day. For example, it will take a painter two days to paint a room. On the first day, the painter applies the first coat. Two days later, on the second day of the task's duration, the painter applies the second coat. In this situation, you could split the task to show that the painter works on the task on two non-consecutive days. This type of scheduling would enable the painter to work on other tasks between the first day and second day of the split task.

As you track your project and mark tasks complete, you may also need to split tasks that are partially complete. You can then reschedule the unfinished work for a later time.



Splitting a task

To remove a split, drag one portion of the split task bar until it touches another portion of the split bar.

Step-by-Step

Split a task.

If necessary, switch to the **Resource Sheet** view. Notice that the **6 Contracting Specialist** resource appears in red, indicating it is overallocated.

Switch to the **Gantt Chart** view. Scroll as necessary to view the task bars for the **6 Obtain Permits** and **7 Obtain Bids** tasks. Notice that the tasks overlap.

Steps	***Practice Data***
1. Click the **Split Task** button in the **Schedule** group on the **Task** tab.	Click

Steps	*Practice Data*
2. Point to the area of the task bar where you want the split to begin. *The mouse pointer changes into a split bar with an arrow and the ScreenTip reflects the day and date where the mouse pointer is resting.*	Point to the task bar for the **6 Obtain Permits** task and rest the mouse pointer where the ScreenTip displays **Tue 7/11/06**
3. Drag the mouse button from the start of the split to the location where you want work on the task to begin again. *The task is split at the desired location and an ellipsis indicates the split.*	Drag from the **Tue 7/11/06** position until the **Start** date in the ScreenTip is **Thu 7/13/06**

Switch to the **Resource Sheet** view and notice that the **6 Contracting Specialist** resource no longer appears in red.

Remove the split by dragging the second half of the split task bar, which begins on **7/13/06**, until it touches the first part of the split task bar.

Change the relationship of the **6 Obtain Permits** and **7 Obtain Bids** tasks to **Finish-to-Start** and remove the lag time.

CHANGING LEVELING TO AUTOMATIC

Discussion

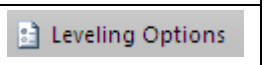
When leveling for resources is set to automatic, Microsoft Project levels tasks as soon as an overallocated resource is detected. This type of leveling takes place as tasks are entered into the project. While allowing Microsoft Project to level tasks automatically can be helpful, you should remember that you will not know when overallocations exist. For this reason, you may not want to use the automatic feature as it prevents you from seeing overallocations and deciding on the best way to address them.

The first time you select the **Automatic** option, you also need to set any other leveling options as desired in the Resource Leveling dialog box. In addition, if you are in a resource view, you will be prompted to level the entire pool or selected resources when you choose the **Automatic** option. The next time an overallocation occurs, the resource is automatically leveled and you will not be prompted to make any selections.

Step-by-Step

Change leveling to automatic.

Switch to the **Resource Sheet** view. Select the **1 Laborer** resource, which appears in red, indicating that it is overallocated.

Steps	***Practice Data***
1. Select the **Resource** tab. *The **Resource** ribbon appears.*	Click the **Resource** tab
2. View the leveling options for the project.	Click 
3. Select the **Automatic** option under **Leveling Calculations**. *The **Automatic** option is selected.*	Click ○ **Automatic**
4. Change any other leveling options as desired. *The desired leveling options are changed.*	Click ○ **Level entire project** under **Leveling range for '*file name*'**
5. Select **OK**. *The Resource Leveling dialog box closes, the automatic leveling feature is enabled, and the Level Now dialog box opens.*	Click **OK**
6. Select the **Entire pool** or **Selected resources** option. *The desired option is selected.*	If necessary Click ○ **Selected resources**,
7. Select **OK**. *The Level Now dialog box closes and the entire pool or selected resource is leveled.*	Click **OK**

Notice that the **1 Laborer** resource no longer appears in red.

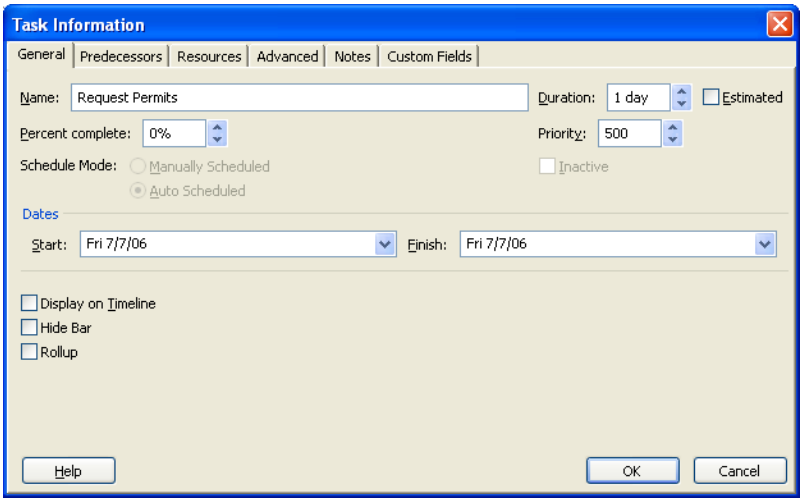
Open the Leveling Options dialog box again and switch the leveling setting back to **Manual**. Select **OK** to close the dialog box. Request Permits

SETTING TASK LEVEL PRIORITY

Discussion

By default, all tasks have a priority level of 500, which is a medium level priority. The higher the priority level assigned to a task, the less likely it is that the task is selected for delay. Therefore, a task with a priority of **900** is less likely to be delayed than a

task with a priority of **400**. You can also assign a priority of **1000** to a task, which indicates that the task is not to be leveled.



Setting a task level priority

If you are working with multiple projects, you can set project priority levels to indicate how you want the tasks in each project leveled in relation to one another.

You can also assign a task priority in a task view by double-clicking the task to open the Task Information dialog box.

Step-by-Step

Set task level priority.

Switch to the **Resource Allocation** view.

Steps	***Practice Data***
1. Select the resource name in the top pane associated with the task you want to prioritize. *The desired resource is selected.*	Scroll as necessary and click the **6 Contracting Specialist** resource in the **Resource Name** column
2. Double-click the task in the bottom pane you want to prioritize. *The Task Information dialog box opens.*	Double-click the **5 Request Permits** task in the bottom pane

Steps	***Practice Data***
3. Select the **General** tab. *The **General** page appears.*	Click the **General** tab, if necessary
4. Select the number in the **Priority** spin box. *The current priority is selected.*	Double-click the number in the **Priority** spin box
5. Enter the desired priority. *The desired priority appears in the **Priority** box.*	Type ***1000***
6. Select **OK**. *The Task Information dialog box closes and the task priority level is set.*	Click **OK**

Remove the window split and switch to the **Gantt Chart** view. Change the relationship of the **4 Request Bids** and **5 Request Permits** tasks to **Start-to-Start**. Switch to the **Resource Sheet** view to see that the **Contracting Specialist** resource, which is assigned to both tasks, appears in red.

Select the **Contracting Specialist** resource, select **Level Now**, and level the selected resources only. Notice that a Microsoft Project warning box opens, advising you that Microsoft Project cannot resolve the overallocation. This occurs since the **1000** priority level assigned to the **Request Permits** task indicates that the task cannot be leveled. Select **Stop** to stop the current operation and close the dialog box.
Close **HOUSE8.MPP**.

LESSON 4 -
WORKING WITH THE CRITICAL PATH

In this lesson, you will learn how to:

- View the critical path
- View slack
- Shorten the critical path
- Assign overtime to a task

VIEWING THE CRITICAL PATH

Discussion

The critical path of a project consists of the tasks that affect the finish date of the project. These tasks are called the critical tasks. If one of the tasks on the critical path finishes late or early, the project finishes late or early.

Before you begin your project, it is important to be aware of which tasks are on the critical path. Then, as you evaluate the progress of the project, you can adjust tasks on the critical path as needed.

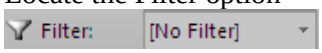
You can use a filter to view the critical path. Applying a filter displays only the critical tasks; the noncritical tasks are hidden.

Applying the **Detail Gantt** view is another way of viewing critical tasks. In this view, the Gantt bars for critical tasks appear in red and noncritical tasks appear in blue.

Step-by-Step

From the Student Data directory, open **HOUSE10.MPP**.
View the critical path.

If necessary, switch to the **Gantt Chart** view.

Steps	***Practice Data***
1. Select the **View** tab on the Ribbon and locate the Data group. This is where *filtering options appears.*	Locate the Filter option 
2. Select **Critical**. *Only the critical tasks appear in the view.*	Change the filter drop down from **[No Filter]** to **Critical**

Notice that the critical path begins with the **10 Build Structure** task.

Click the drop-down again and choose **Clear Filter**.

Apply the Detail Gantt view. Scroll the tasks to notice the blue and red Gantt bars. The **16 Frame House** task is a critical task, and therefore appears in red. Return to the **Gantt Chart** view.

VIEWING SLACK

Discussion

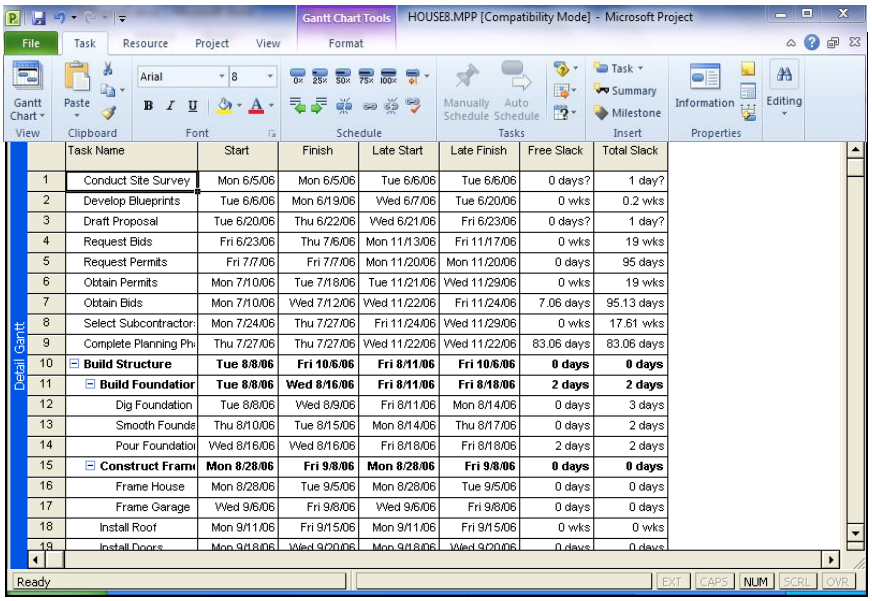
Noncritical tasks can start late without affecting other tasks or the project finish date. These tasks have slack, which is the amount of time a task can be delayed without affecting other tasks. It is helpful to know where slack exists in the schedule. You can use slack to adjust a plan so that a project finishes on schedule. For example, you might be able to move a task with slack to a later start date to free a resource. You can then assign that resource to a critical task to shorten its duration.

By default, critical tasks have slack that is less than or equal to zero days. If your critical tasks can have a different amount of slack, you can change this number in the Options dialog box.

Microsoft Project provides two types of slack: free and total. Free slack is the amount of time a task can be delayed without delaying the start date of another task. Total slack is the amount of time a task can be delayed without delaying the finish date of the project. Microsoft Project calculates slack by comparing the difference between the late start date and the scheduled start date with the difference between the late finish date and the scheduled finish date. The smaller of the two differences is the total slack. If the total slack value is negative, the task's duration is too long for its successor to start at the time designated by a constraint (e.g., a task must start on xx/xx/xx).

You can view slack in the **Detail Gantt** view. In the left pane, you can view the free and total slack amounts. In the right pane, you can view free slack, represented by the slack bars that join the task bars.

Deadline dates affect the slack amounts for noncritical tasks, but do not affect these amounts for critical tasks. If you have a deadline date set for a task that is not critical, the **Total Slack** is the amount of time a task can slip and still meet the deadline date. All tasks linked to the task with the deadline date will also be affected by this date. For example, the first three tasks in your task list are linked. The third task has a deadline date that is two days later than the planned finish date. This task will display a total slack value of **2 days**. Likewise, the first and second task will reflect slack values based on the deadline date, not the project finish date. If you remove the deadline date, the noncritical tasks will reflect the true total slack value, which is the number of days the task can slip without affecting the project finish date.



	Task Name	Start	Finish	Late Start	Late Finish	Free Slack	Total Slack
1	Conduct Site Survey	Mon 6/5/06	Mon 6/5/06	Tue 6/6/06	Tue 6/6/06	0 days?	1 day?
2	Develop Blueprints	Tue 6/6/06	Mon 6/19/06	Wed 6/7/06	Tue 6/20/06	0 wks	0.2 wks
3	Draft Proposal	Tue 6/20/06	Thu 6/22/06	Wed 6/21/06	Fri 6/23/06	0 days?	1 day?
4	Request Bids	Fri 6/23/06	Thu 7/6/06	Mon 11/13/06	Fri 11/17/06	0 wks	19 wks
5	Request Permits	Fri 7/7/06	Fri 7/7/06	Mon 11/20/06	Mon 11/20/06	0 days	95 days
6	Obtain Permits	Mon 7/10/06	Tue 7/18/06	Tue 11/21/06	Wed 11/29/06	0 wks	19 wks
7	Obtain Bids	Mon 7/10/06	Wed 7/12/06	Wed 11/22/06	Fri 11/24/06	7.06 days	95.13 days
8	Select Subcontractor:	Mon 7/24/06	Thu 7/27/06	Fri 11/24/06	Wed 11/29/06	0 wks	17.61 wks
9	Complete Planning Ph	Thu 7/27/06	Thu 7/27/06	Wed 11/22/06	Wed 11/22/06	83.06 days	83.06 days
10	**Build Structure**	**Tue 8/8/06**	**Fri 10/6/06**	**Fri 8/11/06**	**Fri 10/6/06**	**0 days**	**0 days**
11	**Build Foundatior**	**Tue 8/8/06**	**Wed 8/16/06**	**Fri 8/11/06**	**Fri 8/18/06**	**2 days**	**2 days**
12	Dig Foundation	Tue 8/8/06	Wed 8/9/06	Fri 8/11/06	Mon 8/14/06	0 days	3 days
13	Smooth Founds	Thu 8/10/06	Tue 8/15/06	Mon 8/14/06	Thu 8/17/06	0 days	2 days
14	Pour Foundatio	Wed 8/16/06	Wed 8/16/06	Fri 8/18/06	Fri 8/18/06	2 days	2 days
15	**Construct Fram**	**Mon 8/28/06**	**Fri 9/8/06**	**Mon 8/28/06**	**Fri 9/8/06**	**0 days**	**0 days**
16	Frame House	Mon 8/28/06	Tue 9/5/06	Mon 8/28/06	Tue 9/5/06	0 days	0 days
17	Frame Garage	Wed 9/6/06	Fri 9/8/06	Wed 9/6/06	Fri 9/8/06	0 days	0 days
18	Install Roof	Mon 9/11/06	Fri 9/15/06	Mon 9/11/06	Fri 9/15/06	0 wks	0 wks
19	Install Doors	Mon 9/18/06	Wed 9/20/06	Mon 9/18/06	Wed 9/20/06	0 days	0 days

Viewing slack

> To change the default amount of slack time for critical tasks, open the Options dialog box by selecting the **File** tab and clicking **Options**. Then, select the **Advanced** page and change the slack time in the **Tasks are critical if slack is less than or equal to ____ days** spin box.

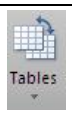
> You may want to be sure you are viewing the most recent calculations of slack time by pressing the **[F9]** key to force calculation.

Step-by-Step

View slack.

Switch to the **Detail Gantt** view.

Drag the split bar as far to the right as possible.

Steps	***Practice Data***
1. Select the **View** tab. *The **View** ribbon appears.*	Click **View**
2. Click the **Tables button** *The **Table** list appears.*	

Steps	*Practice Data*
3. Select the **Schedule** table from the list. *The format of the view changes to display the **Schedule** table, which contains the **Free Slack** and **Total Slack** columns.*	Click **Schedule**

Scroll as necessary to view the **Free Slack** and **Total Slack** columns. Notice that most of the tasks and subtasks for **10 Build Structure** and **23 Build Infrastructure** have free and total slack amounts of **0 days**, indicating they are tasks on the critical path.

Notice that the **3 Draft Proposal** task has a total estimated slack amount of **1 day**; this is the amount by which the task can slip and still meets it deadline date. View the **5 Request Permits** task and notice the total slack amount is **95 days**. Use the **Advanced** page in the Task Information dialog box to apply a deadline date of **7/11/06** to the task. Notice that the total slack amount changed to **2 days**, which is the amount by which the task can slip and still meet its deadline date.

Drag the split bar to the left. Scroll the **Detail Gantt** view as necessary to view the free slack bars in the right pane.

SHORTENING THE CRITICAL PATH

Discussion

After you create a project, you can evaluate it to see if it still meets your objectives before you actually start. For example, you may notice that tasks on the critical path will take too long to complete. To solve this problem, you could shorten the critical path in order to finish the project by the finish date. You can shorten the path before you begin a project, or as a project progresses and tasks are not completed as planned.

You can use several methods to shorten the critical path, including decreasing task durations, adding lead time or resources, scheduling overtime, or increasing resource work hours. When you shorten the critical path, however, you should be aware that the cost of the project usually increases and may cause an overallocation of some resources.

Each option for shortening the critical path has its own disadvantages. One disadvantage would be that it may be unrealistic to decrease the duration of a critical task because it cannot be completed in a shorter timeframe. Another disadvantage would be that adding lead time between critical tasks, which does not increase costs, could overallocate resources. If a task is effort-driven, you could add resources to it to shorten the task duration; however, you may not be able to find available resources and it could increase costs. Scheduling overtime can keep tasks on track if they are effort-driven; however, this would increase costs. If you increase the working hours for the resource, the critical tasks would finish sooner; however, this would also

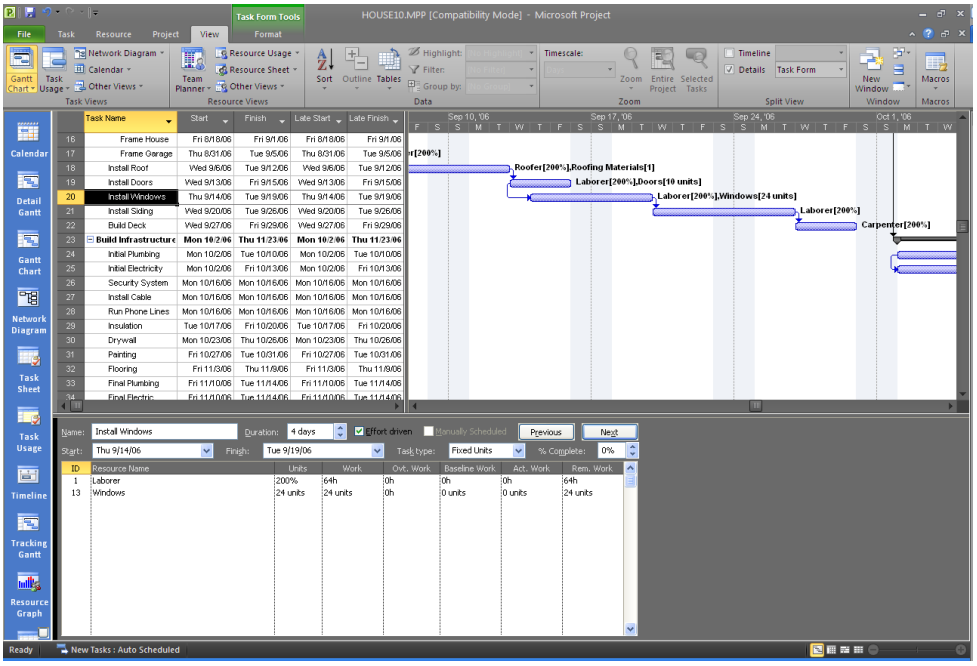
increase costs. All of these options are available to you to keep your project on schedule, but you will need to determine which options are the most effective and appropriate for your particular situation.

ASSIGNING OVERTIME TO A TASK

Discussion

Assigning overtime to resources is one way to shorten the duration of a task because the same amount of work can be completed in a shorter amount of time. You can assign overtime to tasks before you begin a project to eliminate any possible overallocations. You may also need to assign overtime as your plan progresses if it is not going according to schedule.

You can assign overtime work in the **Task Form** view with the **Resource Work** format applied. When you assign overtime, you enter the overtime hours in the **Ovt. Work** field. You do not change the value in the **Work** column since the total amount of work for the task is the same. By adding overtime, you are telling Microsoft Project that some of the work will be performed outside of the normal working hours in the calendar. Microsoft Project subtracts the overtime work from the total work and shortens the duration of the task to reflect the amount of work to be completed during regular working hours.



Assigning overtime to a task

Step-by-Step

Assign overtime to a task.

Switch to the **Gantt Chart** view. Split the view to display the **Task Form** view in the bottom pane.

Steps	***Practice Data***
1. Select the task in the top pane associated with the resource to which you want to assign overtime. *The desired task is selected.*	Scroll as necessary and click the **20 Install Windows** task
2. Select the bottom pane. *The bottom pane is selected.*	Right click anywhere in the bottom pane
3. Select the **Work** command. *The bottom pane changes to the **Resource Work** format.*	Click **Work**
4. Select the **Ovt. Work** field in the bottom pane for the desired resource. *The **Ovt. Work** field is selected.*	Click the **Ovt. Work** field for the **Laborer** resource
5. Enter the number of overtime hours. *The number of overtime hours are entered.*	Type ***8***
6. Select **OK**. *Overtime is assigned to the selected resources.*	Click **OK**

Notice that the duration of the **20 Install Windows** task changed from 4 days to 3.5 days. Remove the window split.
Close **HOUSE10.MPP**.

LESSON 5 -
WORKING WITH BASELINES

In this lesson, you will learn how to:

- Use baselines
- Use baseline tables
- Save a project baseline
- Use the Tracking Gantt
- Update a project baseline
- Update tasks in a baseline
- Save additional baselines
- Save a project interim plan
- Clear a baseline

USING BASELINES

Discussion

A baseline is a copy of the scheduled dates, cost, and work data that is used to track the progress of a project by comparing it against the current schedule. It is usually a copy of the final plan just before the work on a project begins. You must remember to create the baseline copy before you start entering actual data. When you enter actual data, you are recording the schedule as it happens and it may no longer reflect the original plan.

When the baseline is saved, the current dates, work, and cost data are used for comparison with the actual progress of the project. Before deciding on the final baseline, everyone involved in the project should know what is expected of them and agree to perform according to the plan. In addition, necessary approval should be obtained for the required resources.

USING BASELINE TABLES

Discussion

When you first save a baseline, the baseline data and the information in the current schedule will be identical; however, as you track your progress, the actual data could vary from the original plan. Microsoft Project provides three tables that allow you to compare the baseline with the current schedule: **Variance**, **Cost**, and **Work**.

The **Variance** table displays information regarding dates only. This table displays the start and finish dates and baseline start and finish dates, along with the start and finish variances. Until actual information is entered, the start and finish dates display the anticipated start and finish dates. Once the project starts and you enter actual information, the **Start** and **Finish** fields display the actual dates.

The **Cost** table displays cost information, including the total cost, baseline, actual, and remaining cost information. It also displays the variance between the total cost and baseline cost. Tasks that have not started display an actual cost of $0 and a remaining cost that equals the total cost. Once the project starts and you enter actual information, the **Actual** field displays the actual costs. If costs vary from the plan, the **Variance** field will display the difference.

The **Work** table displays information regarding the number of hours of work for each task. It displays the total work, baseline, actual, and remaining work values. It also displays the variance between the total work and baseline values, and the percentage complete for each task. Tasks that have not started display 0 hours of actual work and the remaining work amount equals the total work value. Once the project starts and

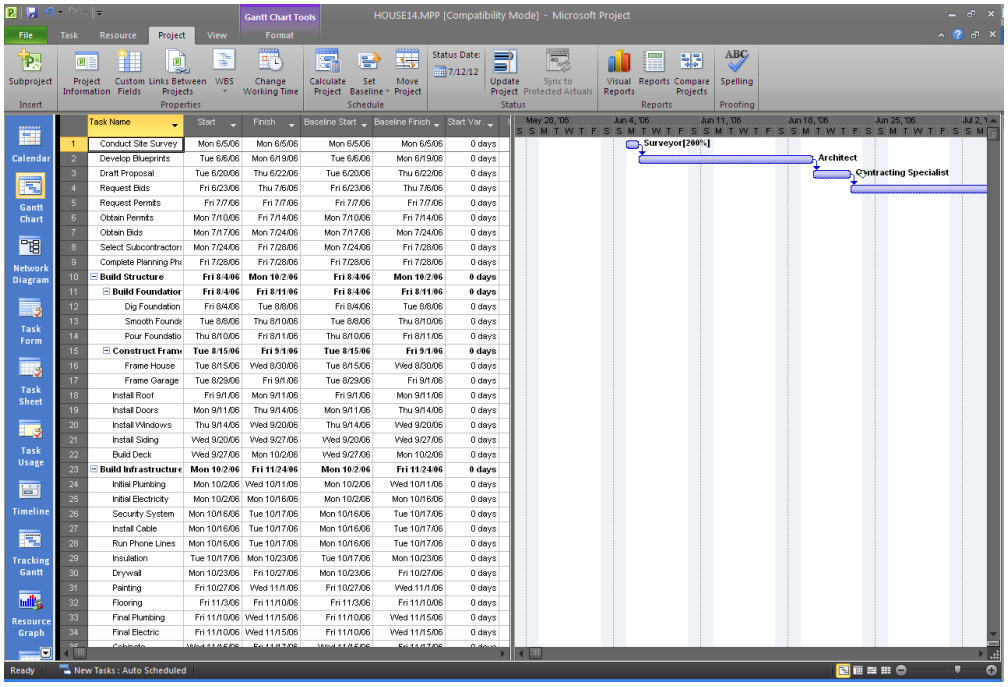
you enter actual information, the **Actual** field will display the actual hours of work. Completed tasks display **100%** in the **% W. Comp.** field.

SAVING A PROJECT BASELINE

Discussion

The baseline plan is the original project plan you save to track progress. The baseline plan includes task start and finish dates, as well as resource and cost information. You can use the baseline to compare with the actual data recorded as your plan progresses. This information may also be useful when the project is completed, should you have a similar project in the future.

When you create a baseline plan, Microsoft Project copies the plan information for dates, work, and cost entered from the current fields into the baseline fields. Baselines can be saved at any time, but it is a good idea to wait until you have completely entered the plan. If you need to change the plan later, you can save the baseline again or save an interim plan.

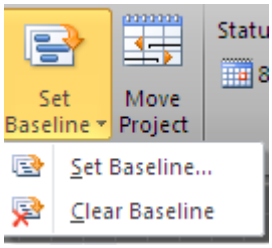


Saving a project baseline

Step-by-Step

From the Student Data directory, open **HOUSE14.MPP**.
Save a project baseline.

In the **Gantt Chart** view, apply the **Variance** table and drag the split bar as far right as possible to view the **Baseline Start** and **Baseline Finish** fields. Notice that there are no baseline start and finish dates yet, as you have not saved the baseline.

Steps	***Practice Data***
1. Select the **Project** tab	Click **Project**
2. Click the **Set Baseline** button drop-down arrow. *The Save Baseline pane opens.*	
3. In the Set Baseline dialog box, select the **Set Baseline** option and select **OK**. *The project baseline is saved and the baseline date and time appear in the Save Baseline pane.*	 Click **set Baseline, and click OK**

Notice that the **Baseline Start** and **Baseline Finish** fields now contain dates which are the same as the current start and finish dates as you have not entered any actual data yet. Apply and view the **Work** table and then the **Cost** table. Notice that all the baseline data matches the current data at this point.

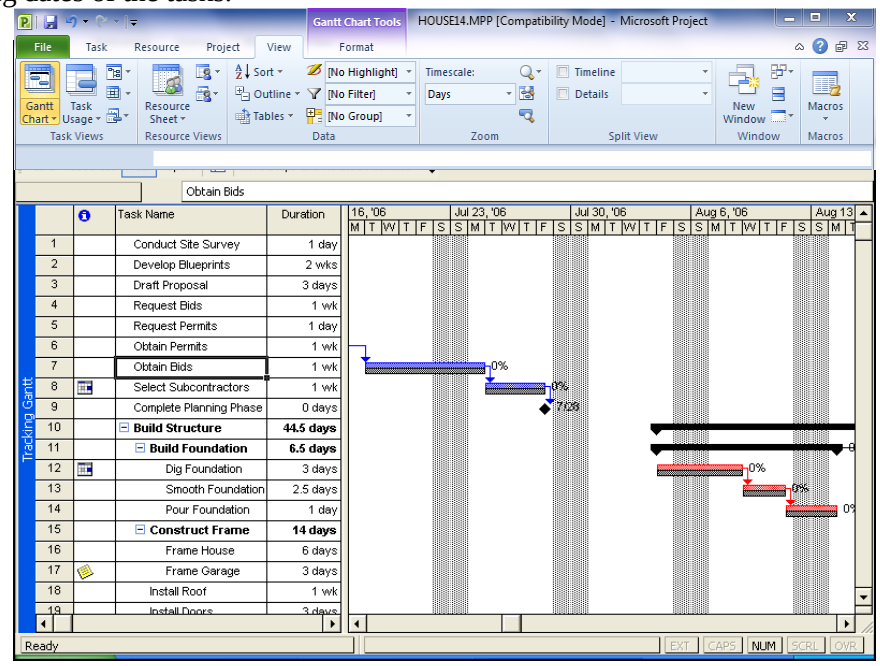
USING THE TRACKING GANTT

Discussion

The baseline saves the start and finish dates for project tasks. As you make changes to the project that affect the original schedule, such as insert new tasks or change task durations, task dates may no longer match the baseline dates. The **Tracking Gantt** view displays any changes that have affected the original schedule saved with the baseline.

The Tracking Gantt chart is similar to the Gantt chart, but it has paired bars for each task. The lower bar displays the baseline start and finish dates and the upper bar displays the scheduled or actual start and finish dates (depending on whether or not the task has started). When you first save a baseline, both bars line up. As you refine

your project plan, the bars will no longer align if your changes affect the starting and ending dates of the tasks.

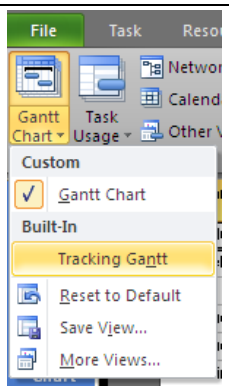


The Tracking Gantt view

> The **Tracking Gantt** view displays Gantt bars for critical tasks in red.

Step-by-Step

Use the **Tracking Gantt** view.

Steps	***Practice Data***
1. Select the **View** tab. *The **View** Ribbon appears.*	Click **View,** then click the Gantt Chart drop down arrow in the upper left as shown below
2. Select the **Tracking Gantt** command. *The **Tracking Gantt** view appears.*	

With the view tab still selected, click the entire project button to zoom the Gantt chart view so that the entire project is displayed on the right-hand side of your screen. Notice that all the blue and red bars line up with the gray bars underneath.

UPDATING A PROJECT BASELINE

Discussion

As you make changes to the original plan, you can update the project's baseline. Updating the baseline for the entire project overwrites all the data in the current baseline with the new information.

Step-by-Step

Update a project baseline.

If necessary, display the **Tracking Gantt** view.

Insert a new task above the **5 Request Permits** task. Name the task **Review Bids** and give the task a duration of **3 days**. Then, assign the **Contracting Specialist** to the task. Scroll to view the Tracking Gantt bar for the new task, **5 Review Bids**. There is no gray baseline bar for the new task. Notice the spread between the baseline (gray) and scheduled (blue) tracking bars for tasks 6 through 9.

Steps	*Practice Data*
1. Select the **Project** tab	Click **Project**
2. Click the **Set Baseline** button drop-down arrow link. *The Save Baseline pane opens.*	
3. In the Set Baseline dialog box, select the **Set Baseline** option and select **OK**. *The project baseline is saved and the baseline date and time appear in the Save Baseline pane.*	Click **set Baseline, and click OK**
4. If necessary, select **The entire project** option. ***The entire project*** *option is selected.*	Click ○ **The entire project**, if necessary, and then Click **OK**.
5. You may be prompted as to whether you wish to overwrite the existing baseline. *The current project baseline is updated.*	Click **Yes** if prompted to overwrite the existing baseline

Notice that all the Tracking Gantt bars line up.

Practice the Concept: The schedule change means that the **6 Request Permits** task will not meet its deadline date. Add the **Surveyor** to the **5 Review Bids** task and accept the smart tag option to reduce the duration. Set the baseline again, and select **OK**. Select **Yes** to overwrite the current baseline.

UPDATING TASKS IN A BASELINE

Discussion

When you save a baseline, the default option makes a copy of the baseline for the entire project; however, you can also save a baseline of selected tasks. Saving a baseline of selected tasks is helpful when you have saved a baseline of the entire project and then realize you need to adjust certain incorrect task information. You can revise the tasks and then update the original baseline for those tasks only.

In addition, during the life of the project you may need to add tasks after the baseline has been saved. You can select those new tasks and add them to your original plan by updating the original baseline.

You can also add selected tasks to a baseline using the Set Baseline dialog box. Select the tasks you want to add, and then select the **Project** tab, the **Set Baseline** drop down, and then the **Selected tasks** option. Select **OK** and then **Yes** to overwrite the current baseline.

Step-by-Step

Update tasks in a baseline.

Switch to the **Gantt Chart** view, apply the **Cost** table, and drag the split bar as far right as possible.

Notice that the **Fixed Cost** field for the **6 Obtain Permits** task displays **$500.00** and the **Baseline** field for this task displays **$1,580.00**. Change the fixed cost of the **Obtain Permits** task to **$400**. Notice that the **Variance** field displays **($100.00)**.

Add a fixed cost of **$25** to the **1 Conduct Site Survey** task. Notice that the total cost changes from **$580.00** to **$605.00**. The variance is **$25.00**

Steps	***Practice Data***
1. Select the **Project** tab	Click the **Project** tab
2. Click the **Set Baseline** button drop-down arrow link. *The Save Baseline pane opens.*	
3. In the Set Baseline dialog box, select the **Set Baseline** option and select **OK**. *The project baseline is saved*	Click **set Baseline,** and click **OK**
4. Select the **Only tasks selected on the right** option. *The **Only tasks selected on the right** option is selected.*	Click ○ **for selected tasks,** then click **OK.**
5. You may be prompted as to whether you wish to overwrite the existing baseline. *The current project baseline is updated.*	Click **Yes** if prompted to overwrite the existing baseline

Notice that the **Baseline** field for the **6 Obtain Permits** task changed to **$1,480.00** and the **Variance** field changed to **$0.00**. The variance for the **1 Conduct Site Survey** task remains at **$25.00** since this task was not added to the baseline.

Practice the Concept: Select the **1 Conduct Site Survey** task. Click the **Set Baseline** button. Select the **Selected tasks** option and select **OK**. Select **Yes** to overwrite the current baseline. Notice that the variance for the **1 Conduct Site Survey** task changed to **$0.00**.

SAVING ADDITIONAL BASELINES

Discussion

If you are creating a large project plan with many phases, you may want to save a separate baseline as you create or finish each phase of the plan. Microsoft Project can create up to 11 baselines with a project. The first baseline saved is named **Baseline**. Additional baselines can then be saved with the names **Baseline 1-10**. Each baseline saves the task, resource and assignment information for the project.

In addition to saving the duration of each task, baselines also save the start date, finish date, and all work and cost information for all tasks and assignments. Baselines also save resource information, which includes all work and cost data.

You can update additional baselines the same way you update the main baseline. You can save the entire project to an additional baseline or just selected tasks.

Step-by-Step

Save an additional baseline.

Steps	***Practice Data***
1. Select the **Project** tab	Click the **Project** tab
2. Click the **Set Baseline** button drop-down arrow link. *The Save Baseline pane opens.*	
3. In the Set Baseline dialog box, select the **Set Baseline** option and select **OK**. *The additional baseline is saved*	Click **set Baseline,** then select **Baseline 1** in the **Set Baseline** drop down box.

Practice the Concept: If necessary, display the **Cost** table. Change the **Fixed Cost** for the **1 Conduct Site Survey** task to **0**. Select the **1 Conduct Site Survey** task and re-open the Set Baseline dialog box. Select **Baseline 1** from the **Set Baseline** list and

select the **Selected tasks** option. Select **OK** and then **Yes** to confirm overwriting the baseline.

Select the **Variance** column, use the **[Insert]** key to insert a new field, and insert the **Baseline1 Cost** field. Notice that the **Baseline1 Cost** is calculated without the **$25.00** fixed cost.

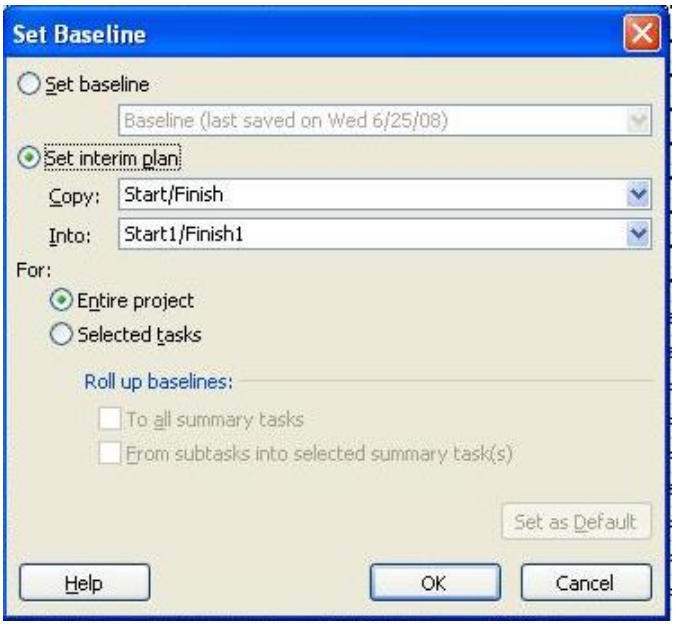
SAVING A PROJECT INTERIM PLAN

Discussion

At certain times during a project, you may want to save only the start and finish dates for tasks. This set of dates is referred to as an interim plan. You can create an interim plan during the planning stage or after the work has begun. Microsoft Project allows you to compare an interim plan with the baseline or current plan to manage your project.

Microsoft Project provides ten sets of interim baseline dates that can be used for comparison in addition to the original baseline dates (saved in the **Baseline Start/Finish** fields). The interim baseline dates are saved in fields named **Start1** through **Start10** and **Finish1** through **Finish10**. You can save the current dates for comparison against these baseline dates, which helps you to analyze problem areas both during and after the project. These fields are for dates only; work and cost values are not included. In addition, no resource or assignment data is saved in an interim plan.

In the Set Baseline dialog box, you can specify in which of the ten fields you want to hold the saved data. If you select fields that already contain data, the new data overwrites the existing data.



Viewing interim plan data

Step-by-Step

Save a project interim plan.

If necessary, switch to the **Gantt Chart** view.

Apply the **Variance** table to the view. Constrain the **2 Develop Blueprints** task so that it starts no earlier than **6/7/06**. Notice that there is now a variance for all the tasks affected by the change.

Steps	***Practice Data***
1. Select the **Project** tab	Click the **Project** tab
2. Click the **Set Baseline** button drop-down arrow link. *The Save Baseline pane opens.*	
3. In the Set Baseline dialog box, select the **Set Baseline** option and select **OK**. *The project baseline is saved*	Click **set Baseline**
4. Select the **Save interim plan** option. *The **Save interim plan** option is selected.*	Click ○ **Save interim plan**

Steps	*Practice Data*
5. Select the **Copy** list. *A list of **Start/Finish** date options appears.*	Click **Copy**
6. Select the fields you want to copy. *The desired fields appear in the **Copy** box.*	If necessary Click **Scheduled Start/Finish**
7. Select the **Into** list. *A list of **Start/Finish** dates appears.*	Click **Into**
8. Select the fields into which you want to copy the selected fields. *The destination fields appear in the **Into** box.*	Click **Start1/Finish1**
9. Select the **Entire project** option. *The **Entire project** option is selected.*	Click **Entire project**, if necessary
10. Select **OK**. *The Set Baseline dialog box closes and the interim plan is saved.*	Click **OK**

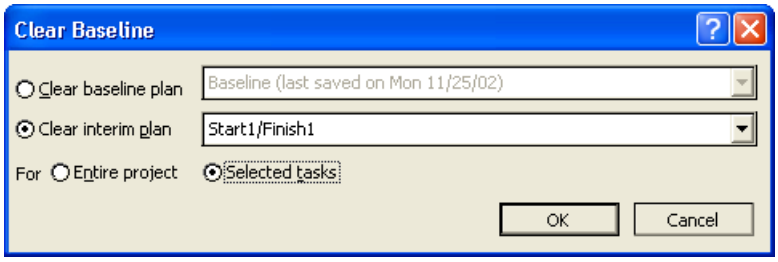
Add the **Start1** column (width of **12**) to the left of the **Baseline Start** column and the **Finish1** column (width of **12**) to the left of the **Baseline Finish** column in the current view. Notice the difference in the dates due to the one day variance.

CLEARING A BASELINE

Discussion

After saving baseline data, you may decide that you do not want this data used for comparison purposes. If desired, you can clear the baseline and save it at a later time. You may also want to clear baseline data if you plan to use a completed project as the basis for future projects.

You can clear baseline information for the entire project or for a particular task. In addition, you can clear the dates saved in an interim plan as desired.



The Clear Baseline dialog box

Step-by-Step

Clear a baseline.

If necessary, switch to the **Gantt Chart** view, apply the **Variance** table, and drag the split bar as far right as possible.

Steps	***Practice Data***
1. Select the **Project** tab	Click the **Project** tab
2. Click the **Set Baseline** button drop-down arrow link. *The Save Baseline pane opens.*	
3. Select the **Clear Baseline** command. *The Clear Baseline dialog box opens.*	Click **Clear Baseline...**
4. Select the **Clear baseline plan** or **Clear interim plan** option. *The desired plan is selected.*	Click ○ **Clear interim plan**
5. Select the list for the selected plan. *A list of plans appears.*	Click **Clear interim plan**
6. Select the plan you want to clear. *The plan is selected.*	Click **Start1/Finish1**
7. Select the **Entire project** or **Selected tasks** option. *The desired option is selected.*	Click ○ **Selected tasks**
8. Select **OK**. *The Clear Baseline dialog box closes and the baseline information is cleared.*	Click **OK**

Notice that **NA** now appears in the **Start1** and **Finish1** fields for the **Develop Blueprints** task.

Select the **Develop Blueprints** task, if necessary, and open the Set Baseline dialog box. Restore the date information by saving the **Start1/Finish1** interim plan for the selected task. Then, hide the **Start1** and **Finish1** columns.

Close **HOUSE14.MPP**.

LESSON 6 -
TRACKING YOUR PROGRESS

In this lesson, you will learn how to:

- Track progress
- Update a completed task
- Set the status date
- Update a task on schedule
- Update a task not on schedule
- View slippage
- Update projects on schedule
- Enter the percent complete
- Enter completed and remaining work
- Enter actual and remaining durations
- Enter timephased work values
- Reschedule uncompleted work
- Apply progress lines
- View summary information

TRACKING PROGRESS

Discussion

Once the project has started, it is extremely important that you track the progress of the individual tasks and the project as a whole. Tracking the project involves entering and revising date, cost, and work information; comparing the actual data to the baseline plan; and viewing project progress using the various tools provided by Microsoft Project.

As a project progresses, you may discover tasks that start early or finish late, as well as tasks that cost more or less than expected. As you analyze the task relationships that exist, you may want to revise some of them in order to stay on or near schedule. You may need to modify tasks in order to meet the projected finish date. As you record the actual information into your project, Microsoft Project reschedules the tasks that are affected by this data. As you look at the affected tasks, you can take corrective action as soon as possible to minimize future problems. You can also look at various scenarios using what-if analysis to help you decide on the best solution.

Microsoft Project provides several methods for recording progress. If a task has been completed according to schedule, you can mark it 100% complete. Then, all projected task information, such as the start and finish dates, duration, work, and costs are copied into the corresponding fields for actual data. Therefore, if a task with 16 hours in the **Work** field is completed as scheduled, 16 hours will be copied to the **Actual Work** field, along with the original start and finish dates, duration and costs. If all the tasks up to a certain date have been completed as scheduled, you can use that date to update multiple tasks at the same time.

You can also record information for tasks in progress by manually entering the percentage of the task currently completed or the number of hours the resources have already worked. In addition, if the task in progress is on schedule, you can use the current date or status date to automatically calculate the partial data.

For tasks that are not on schedule, such as those starting or finishing early and/or late, or requiring more or less work, you can enter specific information. For example, you can enter the actual start and finish dates or change the actual work and duration values.

You should update your project often. These updates allow Microsoft Project to warn you of potential problems and help your project get completed as close to the original finish date and budget as possible.

UPDATING A COMPLETED TASK

Discussion

Microsoft Project allows you to update completed tasks that start and finish on schedule. When a task is marked as 100% complete, the corresponding data in the **Start**, **Finish**, **Duration**, **Work**, and **Cost** fields is automatically copied to the actual data fields for the task. In addition, the Gantt chart displays a thin, black bar within the thicker task bar called the progress bar. The progress bar indicates the task's progress or its percentage of completion. When a task is marked as 100% complete, the progress bar extends the entire length of the task bar. A check mark appears in the **Indicators** column in the **Gantt Chart** view, indicating that the task is complete.

Progress tracking tools on the Task Ribbon

> In addition to marking a task 100% complete, you can use the buttons on the **Task** ribbon to record that a task is 25%, 50%, and 75% complete. You can also remove recorded progress by marking a task as 0% complete.

Step-by-Step

From the Student Data directory, open **HOUSE15.MPP**.
Update a completed task.

If necessary, switch to the **Gantt Chart** view.

Display the **Task Ribbon**.

Steps	***Practice Data***
1. Select the task you want to mark as complete. *The desired task is selected.*	Click the **1 Conduct Survey** task, if necessary

Steps	*Practice Data*
2. Click the **100% Complete** button *The task is marked complete and the **Act. Start** and **Act. Finish** fields are completed.*	Click 

Notice that a check mark appears in the **Indicators** field for the task and the progress bar extends the full length of the task bar.

Practice the Concept: Mark the **2 Develop Blueprints** task as 50% complete. Notice that the progress bar only extends half the length of the task bar.

Display the **Tracking** table and drag the split bar as far right as possible. Notice the data that appears in the actual fields for the tasks updated with completed work. The **1 Conduct Site Survey** task is marked as **100%** in the **% Comp.** column. Since the task is complete, **0 days** appears in the **Rem. Dur.** (remaining duration) column. Notice that the **2 Develop Blueprints** task is listed as 50% complete and still has a remaining duration of 1 week.

Select the **2 Develop Blueprints** tasks and use the **0%** button to remove all actual data.

SETTING THE STATUS DATE

Discussion

Some methods of recording progress need a status date when updating tasks. Although Microsoft Project uses the current date if you do not enter a status date, it is often useful to set separate dates when recording progress. You can use the current date if you are entering progress that was completed today, or if a task is proceeding as scheduled. If you are late in entering progress information, you may want to select an earlier date to reflect the true progress of the tasks you are updating.

It is important to set a status date if you are rescheduling uncompleted work. Uncompleted work is automatically scheduled after the status date (or current date if a status date has not been set).

The status date is also used when you want to analyze the project status at various times throughout its duration. Changing the status date, allows the program to compare your baseline information with the date, cost, and work information for a date other than the current date. If you do not enter a status date, the current date is used for updating tasks and analyzing progress.

The status date is saved with the project file.

A dotted line appears in the Gantt chart for the date set in the **Current date** box in the Project Information dialog box.

If you deselect the **Updating task status updates resource status** option on the **Schedule** page of the Options dialog box, Microsoft Project will not enter values in the **Actual Work** field when you enter a percent complete or change the actual or remaining duration.

Step-by-Step

Set the status date.

Steps	***Practice Data***
1. Select the **Project** tab. *The **Project** Ribbon appears.*	Click the **Project** tab
2. Select the **Project Information** button.	Click 
3. Select the text in the **Status date** box. *The text is selected.*	Drag to select the text **NA** in the **Status date** box
4. Enter the desired status date. *The status date appears in the **Status date** box.*	Type ***6/16/06***
5. Select **OK**. *The Project Information dialog closes.*	Click **OK**

Microsoft Project will use this date when comparing information to the baseline plan.

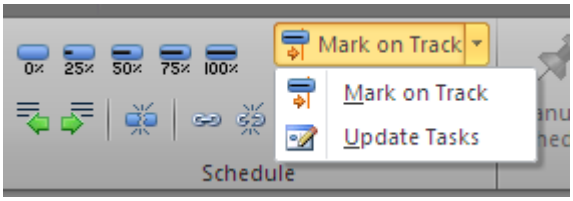
Practice the Concept: Open the Project Information dialog box, enter **6/20/06** into the **Current date** box and close the dialog box. Drag the split bar to the left to display the Gantt chart. Notice that a dotted vertical line appears between the **M** (Monday) and **T** (Tuesday) for the week of **Jun 18, '06**, indicating the current date just entered. Drag the split bar as far right as possible.

UPDATING A TASK ON SCHEDULE

Discussion

You can easily track a task that is on schedule using the **Mark on Track** button on the **Task Ribbon**. When Microsoft Project updates a task as on track, it uses the status date (or current date if a status date has not been set) to track progress. You can update completed tasks and tasks that are still in progress. A task that is in progress is one that has started but has not yet finished, and can be ahead of schedule, on schedule, or behind schedule. If a task is in progress, it will have a percent complete value between zero and 100.

When you update a task as on track, Microsoft Project copies the scheduled date for the task into the **Act. Start** field for the task. It also estimates the percentage and amount of completed work for the task using the current date you entered and the start date of the task. It calculates the number of days between these two dates and divides that number by the total length of the task to calculate the percent complete value.



Updating a task as on track

> A Planning Wizard dialog box opens if the time span includes a task with a constraint or deadline date.

> You can update multiple tasks on schedule by selecting the tasks before you click the **Mark on Track** button.

Step-by-Step

Update a task as on track.

If necessary, switch to the **Gantt Chart** view. Apply the **Tracking** table, drag the split bar as far right as possible, and display the **Task Ribbon**.

Note: The status date for this project is set to **6/16/06**.

Steps	*Practice Data*
1. Select the task in progress you want to update. *The desired task is selected.*	Click the **2 Develop Blueprints** task
2. Click the **Mark on Track** button on the **Task Ribbon**. *The appropriate fields for the task are updated or a Planning Wizard dialog box opens if the task has a constraint or deadline date.*	Click 
3. If a Planning Wizard dialog box opens, select **OK**. *The project is updated.*	Click **OK**

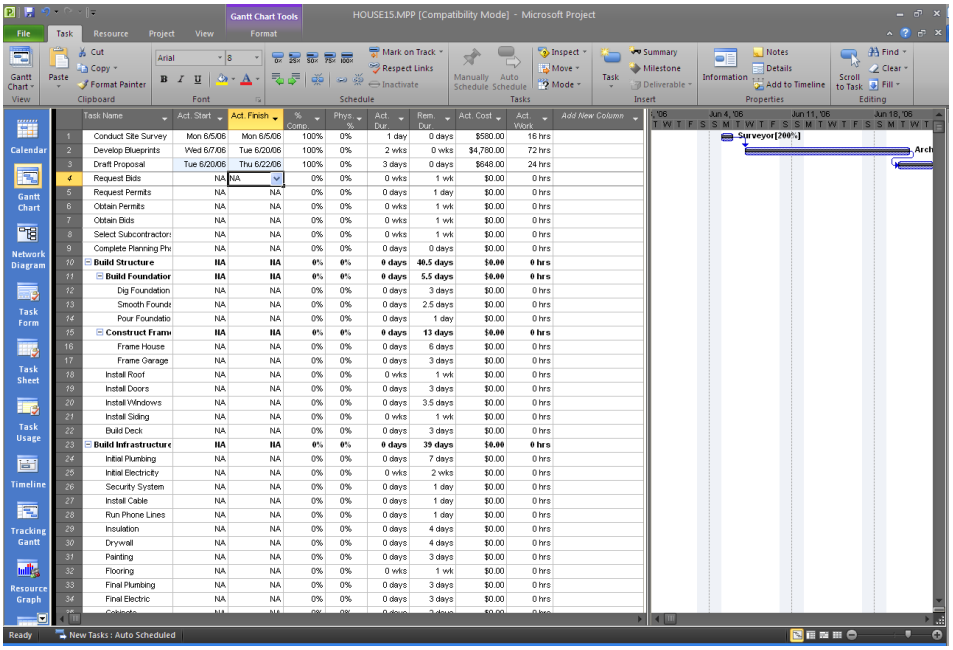
Notice that the **% Comp.** column displays **80%** since this task is scheduled to be completed on **6/20/06**. Mark the task as 100% complete.

UPDATING A TASK NOT ON SCHEDULE

Discussion

Tasks usually do not progress as originally planned. A task may start or finish early, on schedule, or late. You can enter the data in several different ways in these situations.

If a task starts on schedule but finishes late, you can enter the actual finish date in the **Act. Finish** field of the **Tracking** table. Microsoft Project will then mark the task as **100%** complete in the **% Comp.** field. If a task starts early or late, but finishes on schedule, you can enter the actual start date in the **Act. Start** field of the **Tracking** table. You will also need to enter **100%** in the **% Comp.** field as the task will not automatically be marked complete. If a task starts early or late and finishes early or late, you can enter the actual dates in the **Act. Start** and **Act. Finish** fields. Microsoft Project will automatically mark the task as **100%** complete.



Updating a task not on schedule

> If a task with a constraint or deadline date is impacted by a task that is not on schedule, a Planning Wizard dialog box will open. You then need to select an option in the dialog box and adjust the schedule as necessary.

Step-by-Step

Update a task not on schedule.

If necessary, switch to the **Gantt Chart** view and drag the split bar as far right as possible.

Apply the **Entry** table. Notice that the **3 Draft Proposal** task is recorded as starting on 6/21/06 and finishing on 6/23/06. This task, however, started early and finished late. Apply the **Tracking** table.

Steps	***Practice Data***
1. Select the **Act. Start** field for the desired task. *The **Act. Start** field is selected for the desired task.*	Click the **Act. Start** field for the **3 Draft Proposal** task

Steps	*Practice Data*
2. Enter the actual start date for the task. *The actual start date appears in the **Act. Start** field.*	Type ***6/20/06***
3. Select the **Act. Finish** field for the desired task. *The **Act. Finish** field is selected for the desired task.*	Click the **Act. Finish** field for the **3 Draft Proposal** task
4. Enter the actual finish date for the task. *The actual finish date appears in the **Act. Finish** field.*	Type ***6/26/06***
5. Press **[Enter]**. *The date is entered into the field, the task is marked as 100% complete, and the actual duration appears in the **Act. Dur.** field.*	Press **[Enter]**

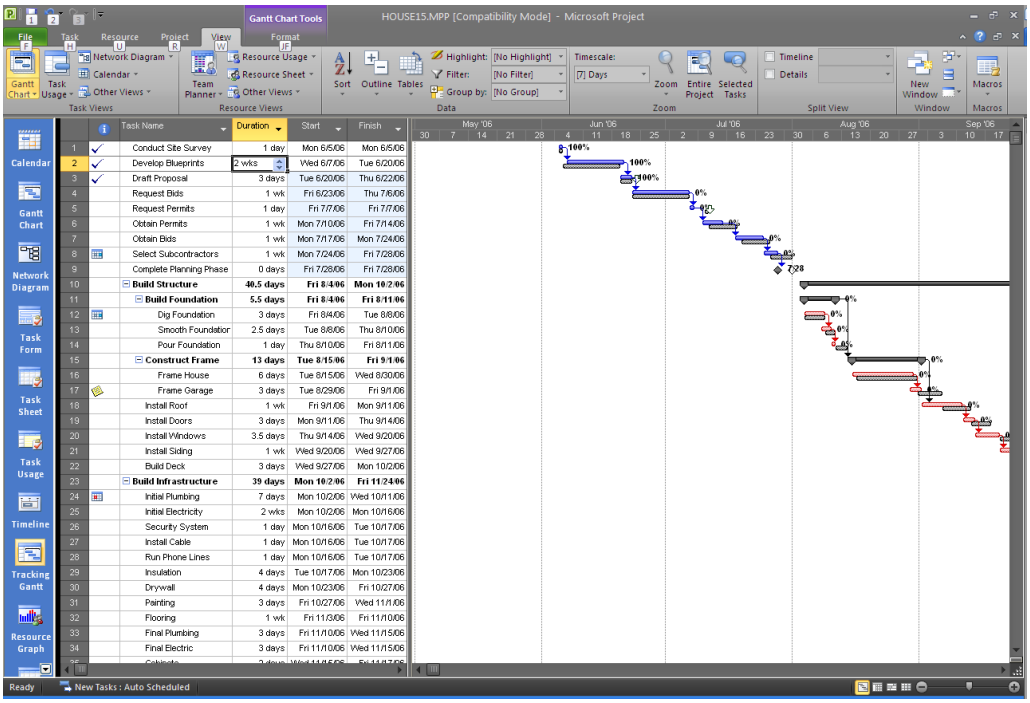
Practice the Concept: Enter the actual start date of **6/27/06** for the **4 Request Bids** task. If necessary, display the Task Ribbon and mark the **4 Request Bids** task as 100% complete. This task started late due to the late start of the **Draft Proposal** task. In addition, the **Contracting Specialist** is assigned to the task and is on vacation from **June 28 - July 4**. However, the task was finished on time (i.e., according to the scheduled task duration of one week).

VIEWING SLIPPAGE

Discussion

If a task starts later than the original baseline start date, or the duration is longer than what was originally planned, the task has slipped. Microsoft Project refers to this situation as slippage, which is measured by the amount of time a task's schedule is behind its baseline dates.

You can view slippage in the **Tracking Gantt** view. The tracking Gantt chart is similar to the Gantt chart, but it has paired bars for each task. The lower bar displays the baseline start and finish dates and the upper bar displays the scheduled or actual start and finish dates (depending upon whether or not the task has started). If the bars do not line up on the timescale, the task has slipped. The farther apart the bars are located, the greater the slippage.



Viewing slippage

> You can also view slippage by using the Gantt Chart Wizard and selecting the **Baseline** format.

Step-by-Step

View slippage.

Switch to **Tracking Gantt View.**

Scroll the right pane as necessary to view task slippage. Notice that the bars for the **2 Develop Blueprints** task through the **8 Select Subcontractors** task do not line up, indicating that the tasks have slipped.

Apply the **Variance** table and drag the split bar as far right as possible. Compare the baseline and actual start and finish dates. Notice the start variance and finish variance values for tasks 1 through 9.

Return to the **Gantt Chart** view.

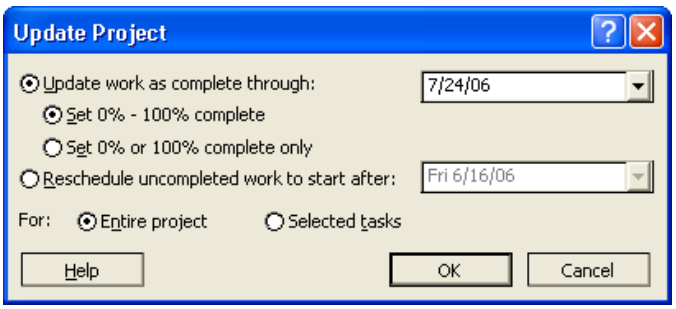
UPDATING PROJECTS ON SCHEDULE

Discussion

If a project has proceeded as scheduled up to a certain date, Microsoft Project can automatically update the progress of all the tasks in that time span. By default, the program uses the status date for updating tasks. If you have not entered a status date, the current date will be used instead. However, while updating a project, you have the opportunity to enter another date. This date is then saved as the new status date for the project.

If a task was completed before the end of the status date, it will be recorded as 100% complete. The original starting and ending dates, duration, work and cost values will be copied into the actual value fields. Values for incomplete tasks will be recorded according to the percentage of work assumed to have been completed. However, if you do not want to record information for incomplete tasks, you can choose to update tasks that have not yet started (0%) and those that are 100% complete only.

You can choose to update the work for an entire project or just for selected tasks. In addition, you can reschedule uncompleted work to start after a date that you specify.



The Update Project dialog box

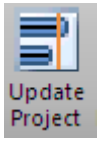
A Planning Wizard dialog box opens if the time span includes a task with a constraint or deadline date.

To update selected tasks only, select them before opening the Update Project dialog box and then select the **Selected tasks** option.

Step-by-Step

Update a project on schedule.

If necessary, switch to the **Gantt Chart** view and apply the **Tracking** table.

Steps	***Practice Data***
1. Select the **Project** tab	Click the **Project** tab
2. Click the **Update Project** button. *The Update Project dialog box opens*	
3. Enter the desired date in the **Update work as complete through** box. *The selected date appears in the* ***Update work as complete through*** *box.*	Change the date in the **Update work as complete through** box to **7/24/06**
4. Select **OK**. *The Update Project dialog box closes and a Planning Wizard opens or the project is updated using the selected date.*	Click **OK**
5. If a Planning Wizard dialog box opens, select **OK**. *The project is updated.*	Click **OK**

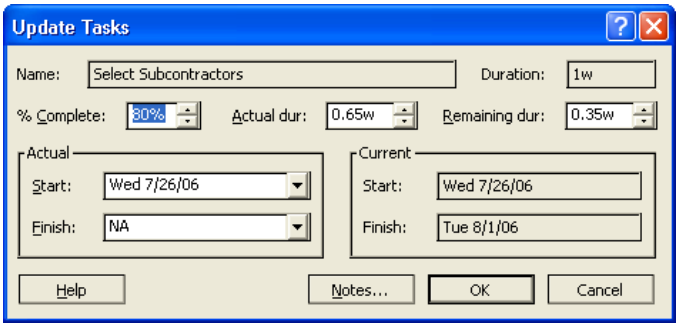
Notice that completed values have been entered for the **5 Request Permits** and **6 Obtain Permits** tasks, but the **7 Obtain Bids** task is only **60%** complete and still has a remaining duration of **0.4 wks**. Drag the split bar to the left and view the progress bars for the tasks.

ENTERING THE PERCENT COMPLETE

Discussion

When you automatically update a task as scheduled, Microsoft Project calculates the percent complete value for the task using the number of days between the current date you entered and the start date of the task. Sometimes the number of days passed is not a true indicator of the actual percentage of work completed on the task. You will then want to enter the percent complete value manually to indicate a more realistic estimate of the completed work.

While you can use the buttons on the **Task Ribbon** to enter values in 25% increments, you may need to enter a value, such as 40%. Any percentage of completed work can be recorded by directly typing the value into the **% Work Complete** field. This field is available by displaying the **Tracking** table. In addition, you can also use Update Tasks dialog box to enter the percent of work complete. When entering completion percentages, you can either type the value or use the corresponding spin box.



The Update Tasks dialog box

After selecting a task, you can open the Update Tasks dialog box using the **Update Tasks option** (click the drop down arrow to the right of the **Mark on Track** button) on the **Task Ribbon.**You can use the Update Tasks dialog box to update information in any of the fields that it contains.

You can also enter a completion percentage for a task on the **General** page of the Task Information dialog box.

Step-by-Step

Enter the percent complete.

Display the **Project Ribbon**, and click the Project Information button to display the Project Information dialog box. Enter a status date for the project of **7/28/2006**, and click OK to close the dialog.

Switch to **Gantt Chart** view, and if necessary, change the table view to **Tracking**.

Steps	*Practice Data*
1. To use the table to enter the percentage of work complete, select the **% Work Complete** field for the desired task. *The field is selected and the spin box appears.*	Click in the **% Work Complete** field for the **8 Select Subcontractors** task
2. Type the desired value. *The value appears in the **% Work Complete** field.*	Type ***65***
3. Press **[Enter]**. *The progress information is updated.*	Press **[Enter]**
4. To enter a percentage using the Update Tasks dialog box, select the task you want to update. *The desired task is selected.*	Click the **8 Select Subcontractors** task
5. Enter the actual percentage of work completed in the **% Complete** field. *The percentage appears in the **% Complete** field.*	Click the **% Complete** to **80%**

If you had updated this task using the **Mark on Track** button, it would only reflect that it was **55%** complete.

View the task bar for the **8 Select Subcontractor** task. Notice that **80%** appears to the left of the task bar.

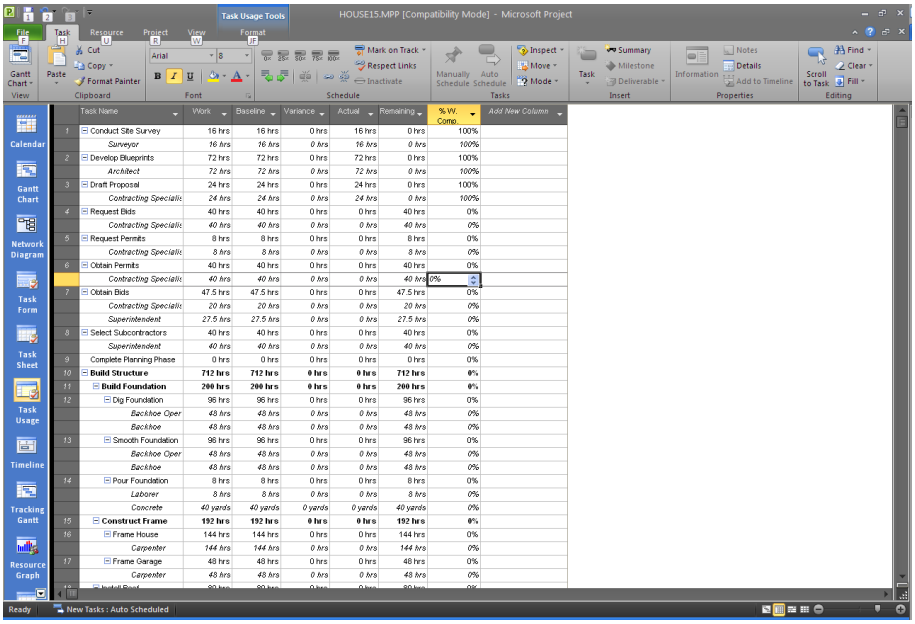
ENTERING COMPLETED AND REMAINING WORK

Discussion

Microsoft Project calculates work values for tasks. You can enter the total hours of work completed and remaining for a task. If a single resource is assigned the task, the work values are applied to that resource. If multiple resources are assigned to the task, the hours are distributed in relation to the percentage of time each resource is scheduled to spend on the task.

To update your progress, you can also enter work values for individual resources assigned to the same task. If you have resources that are working on the same task at different rates, you should enter the work for the individual resources instead of the total for the task. When you enter these work values, Microsoft Project sums them automatically to calculate the total work completed on the task to date.

The **Task Usage** view with the **Work** table applied allows you to enter actual and remaining work values for tasks and individual resources.



Entering actual work values – Task Usage View with Work Table

Step-by-Step

Enter completed and remaining work values.

Switch to the **Task Usage** view, apply the **Work** table, and drag the split bar as far right as possible. Double-click the right border of the **Task Name** column to view the entire field.

Since the last time the **7 Obtain Bids** task was updated, the **Contracting Specialist** has performed a total of **15 hours** of work. In addition, due to a scheduling problem, you need to schedule this resource to perform 5 more hours of work that was originally scheduled for the **Superintendent**.

Steps	***Practice Data***
1. To enter actual work completed, select the **Actual** field for the task or for the individual resource assigned to the task you want to update. *The desired **Actual** field is selected.*	Click the **Actual** field for the **Contracting Specialist** resource assigned to the **7 Obtain Bids** task

Steps	***Practice Data***
2. Enter the total number of hours of work completed on the task or the hours of work completed by the individual resource. *The number of hours appears in the **Actual** field and Microsoft Project recalculates the amount of work in the **Remaining** field.*	Type ***15***
3. Press **[Enter]**. *The value is entered and the appropriate fields are updated.*	Press **[Enter]**
4. To enter the remaining work, select the **Remaining** field for the task or for the individual resource assigned to the task you want to update. *The desired **Remaining** field is selected.*	Click the **Remaining** field for the **Contracting Specialist** resource assigned to the **7 Obtain Bids** task
5. Enter the total number of hours of work completed on the task or the hours of work completed by the individual resource. *The number of hours appears in the **Remaining** field.*	Type ***10***
6. Press **[Enter]**. *The value is entered and the appropriate fields are updated.*	Press **[Enter]**

Since the Contracting Specialist will be working 5 extra hours on the **7 Obtain Bids** task, change the **Remaining** work for the **Superintendent** to **6 hours**.

Practice the Concept: Scroll to the **12 Dig Foundation** task. Enter **24 hours** of actual work on the task row. Since both the **Backhoe Operator** and **Backhoe** are assigned equal work units for the task, the work is distributed equally, with each resource assigned **12 hours**.

Switch to the **Gantt Chart** view and drag the split bar as far right as possible. Change the status date to **8/8/06**. Select tasks 6 through 12 and use the **Mark on Track** button on the **Task Ribbon** to update the tasks.

ENTERING ACTUAL AND REMAINING DURATIONS

Discussion

You can update tasks by entering the actual or remaining duration of a task. You can enter this information in the Update Tasks dialog box or in the **Act. Dur.** or **Rem. Dur.** fields in the **Tracking** table.

If you enter an actual duration that is less than or equal to the scheduled duration, Microsoft Project assumes that the work on the task is going according to schedule and automatically sets the actual start date as scheduled. Microsoft Project also completes the percent complete value and remaining duration by comparing the actual duration with the original duration. If you enter an actual duration that is greater than the original duration, Microsoft Project assumes that the task is complete and took longer than expected. The percent complete value is set to 100%, the remaining duration is set to zero, and the current duration is revised to match the longer duration.

If you enter a remaining duration that is different from the current task duration or current remaining duration value, Microsoft Project assumes that you are providing a new estimate of the total duration of the task. If you enter a remaining duration of zero for a task that has started, Microsoft Project marks the task as 100% complete and enters the finish date per the original schedule.

Step-by-Step

Enter actual and remaining durations.

If necessary, switch to the **Gantt Chart** view, apply the **Tracking** table, and drag the split bar as far right as possible.

Steps	***Practice Data***
1. Select the **Act. Dur.** or **Rem. Dur.** field for the task you want to update. *The **Act. Dur.** or **Rem. Dur.** field is selected.*	Click the **Act. Dur.** field for the **13 Smooth Foundation** task
2. Enter the actual or remaining duration. *The actual duration or remaining duration appears.*	Type ***1.5d***
3. Press **[Enter]**. *The actual or remaining duration is entered and Microsoft Project updates the appropriate fields.*	Press **[Enter]**

Notice that Microsoft Project enters a remaining duration of **1 day** since the total task duration is 2.5 days.

Practice the Concept: Enter a remaining duration of **0 days** for the **13 Smooth Foundation** task. Notice that the task is marked **100%** complete. The **14 Pour Foundation** task only took 1/2 day to complete. Enter an actual duration of **.5 days** and a remaining duration of **0 days**.

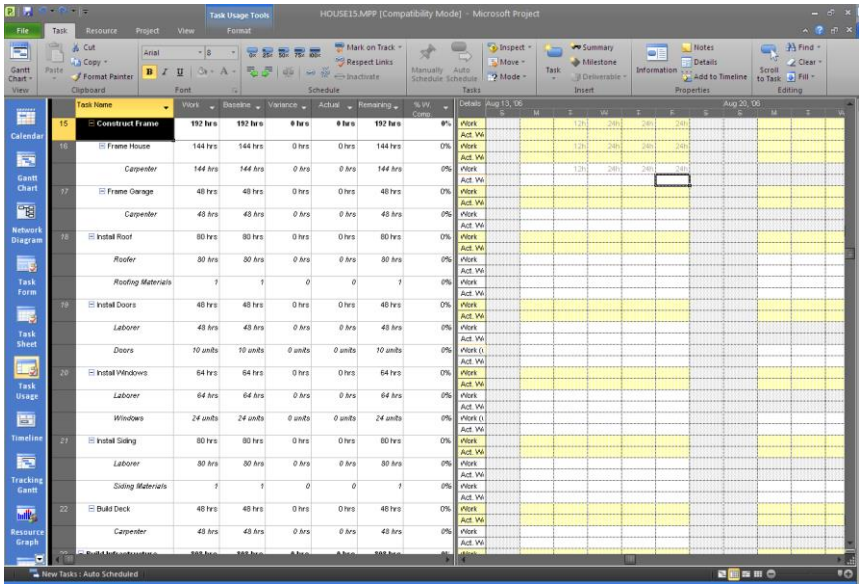
ENTERING TIMEPHASED WORK VALUES

Discussion

Work and cost data that is reported per time interval is known as timephased information. Usage views, such as the **Task Usage** or **Resource Usage** view, display timephased assignment information in the right pane.

The most accurate method of tracking work completed on a task is to enter the amount of actual work done by the resource each day (or the selected interval on your timeline). For example, if the painter spent 5 hours painting doors on October 30th and 8 hours on October 31st, you would enter actual work values of 5 hours for 10/30 and 8 hours for 10/31 for the **Painter** resource on the **Paint Doors** task.

You can record timephased work values in the **Task Usage** view by adding the **Act. Work** detail to the view. In addition, applying the **Work** table allows you to view the total hours worked for a task. While entering timephased information is the most accurate way to report progress, it is also the most time-consuming.



Entering timephased work values

> In addition to analyzing work over a period of time, you can analyze costs over a period of time by selecting **Cost** or **Actual Cost** field from the right click list.

> You can change the timescale in a usage view to record work per minute, hour, day, week, month, quarter, or you can create a custom time interval. The timescale is saved with the view.

> After entering a value in a cell in the timephased area, you can press one of the keyboard arrow keys to move in the desired direction.

Step-by-Step

Enter timephased work values.

Switch to the **Task Usage** view and apply the **Work** table. Right-click in the right-hand area of the screen and select the **Actual Work** command. If necessary, drag the split bar so that the timephased details start to the right of the **Work** field in the table.

Select the **16 Frame House** task and use the **Scroll to Task** button to scroll to the work assignment.

Steps	*Practice Data*
1. Select the **Act. Work** field for assigned resource for which you want to enter timephased work values. *The desired **Act. Work** field for the resource is selected.*	Scroll as necessary and click the **Act. Work** field in the first **T** column under the **24h** for the **Carpenter** resource (for the date **8/15/06**)
2. Enter the desired value. *The desired value is entered.*	Type ***28***
3. Press **[Enter]**. *The actual work value for the resource is entered and added to the actual work value for the task.*	Press **[Enter]**
4. Continue to change the work values as desired. Add actual hours for the **Carpenter** on the **Frame House** Task. *The contour of the work assignment changes accordingly.*	Enter **28 hours** of actual work for Wednesday, press the right arrow, Enter **20 hours** of actual work for Thursday and Friday

Practice the Concept: Scroll to the week of **Aug 27, 06**. For the carpenter, enter **24 hours** of actual work for Monday. Due to good weather, the carpenters are ahead of schedule. Enter **16 hours** of actual work for Tuesday, which finishes the task.

Because Microsoft Project does not know that the task is done, it scheduled the remaining 8 hours of work on Wednesday. Add the **Remaining Duration** field to the Gantt table and change the value to **0d** and close the dialog box. Notice that the 8 hours of work scheduled for Wednesday was removed. Marking the task as 100% complete would not have removed the 8 hours of work scheduled for Wednesday. Microsoft Project would have assumed that the task was completed as scheduled.

RESCHEDULING UNCOMPLETED WORK

Discussion

Projects do not always proceed according to plan. If work has not been completed on time, you can reschedule the uncompleted work for another date. You can manually reschedule the work by splitting a task or you can let Microsoft Project reschedule the uncompleted work for you.

When Microsoft Project reschedules a task, it reschedules uncompleted work after the status date or a date you specify. You can let the program reschedule uncompleted work for the entire project or for selected tasks only.

If you use the status date to reschedule work, you can use the **Calculation** page in the Options dialog box to choose how rescheduled work that is completed should be treated. Work completed after the status date can be moved back to the status date and work completed before the status date can be moved forward to the status date.

> If you use the status date to reschedule work for a specific task, you can select the task and use the **Update Project** button on the **Task Ribbon**.

> If you do not want Microsoft Project to split tasks that are partially complete, you can disable the **Split in-progress tasks** option on the **Schedule** page of the Options dialog box.

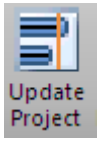
Step-by-Step

Reschedule uncompleted work.

If necessary, display the **Task Ribbon**.

Switch to the **Gantt Chart** view and apply the **Entry** table. Select the **17 Frame Garage** task and mark it as **50%** complete. Drag the split bar to the left and scroll to view the task bar for the task.

The **Carpenter** has jury duty and probably cannot continue the rest of the work until after 9/8/06. You need to reschedule the remainder of the task.

Steps	***Practice Data***
1. To reschedule the uncompleted work for specific tasks, select the desired tasks. *The tasks are selected.*	Select the **17 Frame Garage** task, if necessary
2. Select the **Project** tab	Click the **Project** tab
3. Click the **Update Project** button. *The Update Project dialog box opens*	
5. Select the **Reschedule uncompleted work to start after** option. *The **Reschedule uncompleted work to start after** option is selected.*	Click ○ **Reschedule uncompleted work to start after**

Steps	*Practice Data*
6. Type the desired date in the **Reschedule uncompleted work to start after** box. *The selected date appears in the **Reschedule uncompleted work to start after** box.*	Type ***9/8/06***
7. Select the **Selected tasks** option to reschedule work for selected tasks only. *The **Selected tasks** option is selected.*	Click ○ **Selected tasks**
8. Select **OK**. *The Update Project dialog box closes and uncompleted work before the selected date is rescheduled.*	Click **OK**

The **Frame Garage** task is split, with the uncompleted work rescheduled to start after 9/8/06. The duration of 3 days remains unchanged.

The carpenter was able to return early and finish framing the garage by 9/6/06. Open the Project Information dialog box and change the status date to **9/6/06**. Use the **Task Ribbon** to mark the **Frame Garage** task as **100%** complete. Notice that the progress bar indicates the work was completed after the rescheduled date of 9/8/06. Use the **Undo** button to undo marking the task complete.

You can use the rescheduling options to move completed work around the current status date. Select the **File** tab, the **Options** command, and the **Advanced** tab. Select the **Move end of completed parts after status date back to status date** option and select **OK**. Once again, mark the **Frame Garage** task as **100%** complete. Notice that the completed rescheduled work has moved back to the status date.

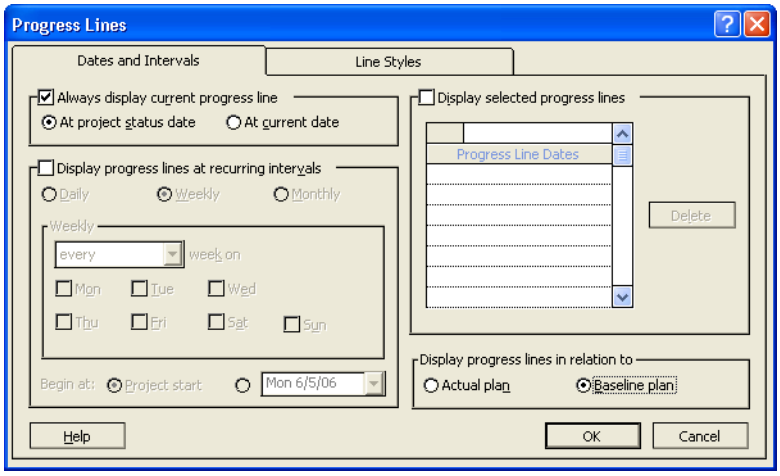
Open the Options dialog box, deselect the **Move end of completed parts after status date back to status date** option and select **OK**.

APPLYING PROGRESS LINES

Discussion

Microsoft Project provides many ways to view the progress of a project. In addition to the different views available, you can display progress lines on the Gantt chart. Progress lines connect tasks in progress and contain peaks that illustrate whether or not a task is behind or ahead of schedule. If a peak points to the left, then the task is behind schedule; if a peak points to the right, then the task is ahead of schedule.

When you apply progress lines, you can display them as of the current date or the status date entered in the Project Information dialog box. The project status date is any date you specify for checking progress. You can also display progress lines on particular dates and at recurring intervals. In addition, you can display progress lines in relation to the actual plan or the baseline plan.



The Progress Lines dialog box

You can display additional progress lines at various dates using the **Progress Line Dates** list in the Progress Lines dialog box. You can also use the **Add Progress Line** button on the **Task Ribbon** to create additional progress lines. To remove any additional progress lines you have created, open the Progress Lines dialog box and use the **Delete** button.

You can double-click an existing progress line to open the Progress Lines dialog box.

Step-by-Step

Apply progress lines.

If necessary, switch to the **Gantt Chart** view.

Check how your project was progressing on June 23, 2006. Open the Project Information dialog box and enter a status date for the project of **6/23/06**. Scroll to view the Gantt bars for tasks 3 and 4.

Steps	***Practice Data***
1. Select the **Format** tab. *The **Format** Ribbon appears.*	Click **Format**
2. Click the drop down under the **Gridlines** button	
3. Select the **Progress Lines** command. *The Progress Lines dialog box opens.*	Click **Progress Lines...**
4. Select the **Dates and Intervals** tab. *The **Dates and Intervals** page appears.*	Click the **Dates and Intervals** tab, if necessary
5. Select the **Always display current progress line** option. *The **Always display current progress line** option is selected.*	Click ☐ **Display:**
6. Select the **At project status date** or **At current date** option. *The desired option is selected.*	Click ○ **At project status date**, if necessary
7. Continue to select options as desired. *The desired options are selected.*	Click the ○ **Baseline plan** option under **Display progress lines in relation to**
8. Select **OK**. *The Progress Lines dialog box closes and the progress lines are applied accordingly.*	Click **OK**

Notice that the progress line appears on the status date of **6/23/06**. The peaks point to the left, indicating that the **Draft Proposal** and **Request Bids** tasks were behind schedule.

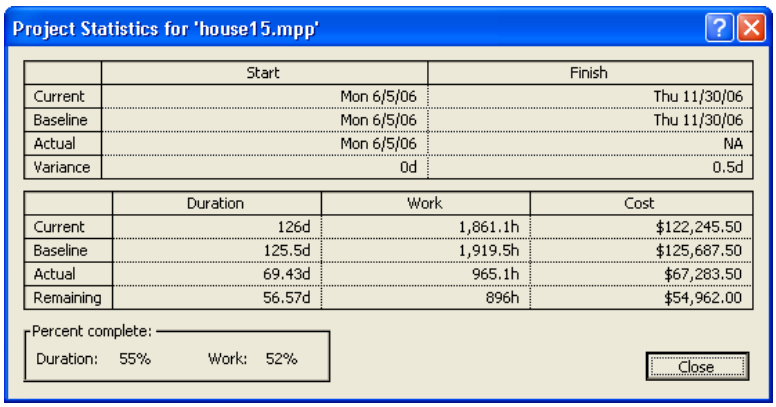
Change the status date to **8/10/06**. Scroll to view the task bars for the week of **Aug 6, 06**. The **13 Smooth Foundation** and **14 Pour Foundation** tasks were ahead of schedule.

Double-click the red progress line to open the Progress Lines dialog box. Deselect the **Always display current progress line** option to remove the progress lines from the Gantt chart and close the dialog box.

VIEWING SUMMARY INFORMATION

Discussion

As you work on your project, you can quickly view summary information in the Project Statistics dialog box. This dialog box is split into three different areas. The top area of the dialog box shows a comparison of the current, baseline, actual, and variance information for a project's start and finish dates. The middle area displays the current, baseline, actual, and remaining information for a project's total duration, work, and cost. The area at the very bottom of the dialog box, in the far left corner, displays the percentage complete for duration and work.



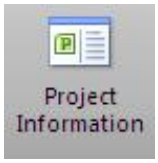
	Start	Finish
Current	Mon 6/5/06	Thu 11/30/06
Baseline	Mon 6/5/06	Thu 11/30/06
Actual	Mon 6/5/06	NA
Variance	0d	0.5d

	Duration	Work	Cost
Current	126d	1,861.1h	$122,245.50
Baseline	125.5d	1,919.5h	$125,687.50
Actual	69.43d	965.1h	$67,283.50
Remaining	56.57d	896h	$54,962.00

The Project Statistics dialog box

Step-by-Step

View summary information.

Steps	***Practice Data***
1. Select the **Project** tab. *The **Project** Ribbon appears.*	Click **Project**
2. Select the **Project Information** button. *The Project Information dialog box opens.*	

Steps	***Practice Data***
3. Select **Statistics**. *The Project Information dialog box closes and the Project Statistics dialog box opens with the summary information displayed.*	Click **Statistics...**
4. Select **Close** when you have finished viewing the summary information. *The Project Statistics dialog box closes.*	Click **Close**

Close **HOUSE15.MPP**.

LESSON 7 -
EVALUATING AND DISTRIBUTING DATA

In this lesson, you will learn how to:

- View earned value data
- View earned value indicators
- Create a report
- Create a custom report
- Create a crosstab report
- Use the Backstage View Preview Pane
- Change page setup options
- Print a report

VIEWING EARNED VALUE DATA

Discussion

As you record actual work on a project, you may want to know how the work performed compares to the baseline. Earned value analysis uses project costs to measure the performance of a project at the time of the project status date. By comparing the cost of work performed to cost of work budgeted, you can view the rate of progress for a project and predict the trend of the project's success. If you do not enter a status date, Microsoft Project uses the current date to perform the earned value calculations.

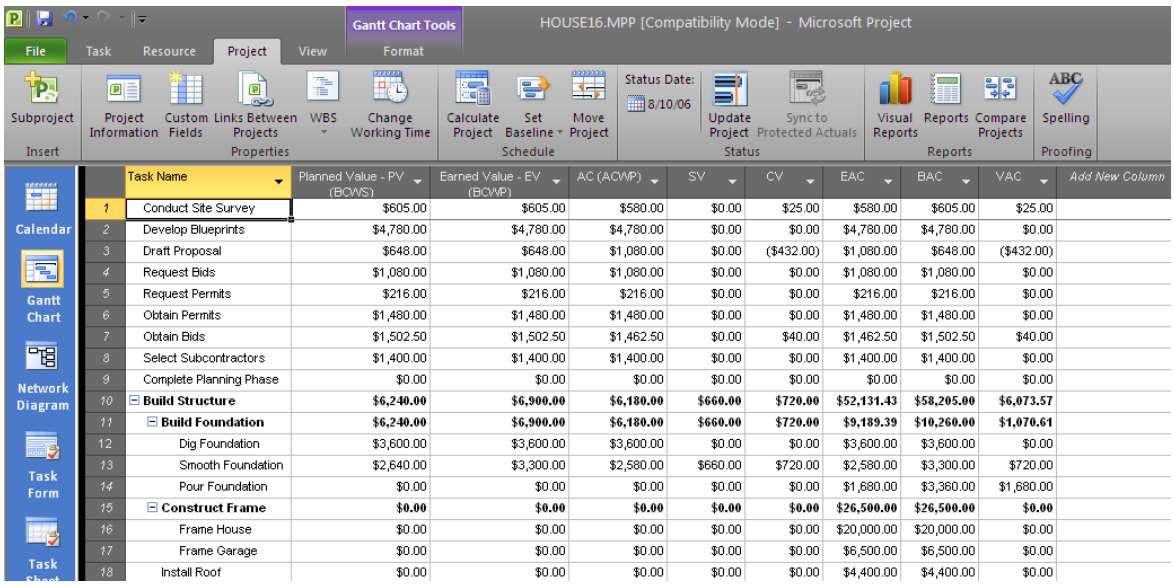
Earned value analysis is based on three key measurements; the budgeted cost of work scheduled to be performed (BCWS), the budgeted cost of work actually performed (BCWP), and the actual cost of work performed (ACWP). For example, at a specific date, a task that is budgeted to cost $8000 should have been 50% complete with a budgeted cost of $4000. At this date, the task is behind schedule and is only 45% complete. According to the original budget, the work performed so far should cost $3600 (8000*.45). However, the actual cost for the work performed is only $3000. So while the task is behind schedule, the cost is less than budgeted.

Microsoft Project provides three tables with earned value data; **Earned Value**, **Earned Value Cost Indicators**, and **Earned Value Schedule Indicators**.

The **Earned Value** table is available for both tasks and resources. This table provides all the cost of work information to help you monitor your progress. The fields in this table are described below:

Field	Description
BCWS	This field displays the budgeted cost of work scheduled through the status date or current date.
BCWP	This field displays the budgeted cost of work performed through the status date or current date.
ACWP	This field displays the actual cost of work performed through the status date or current date.
SV	This field displays the earned value schedule variance through the status date [SV = BCWP - BCWS]. A positive value indicates that costs are under budget and a negative value indicates tasks are over budget.
CV	This field displays the earned value cost variance through the status date [CV = BCWP - ACWP]. A positive value indicates that costs are under budget and a negative value indicates tasks are over budget.

Field	Description
EAC	This field displays the estimated cost at completion. This field reflects the expected cost of the task based on costs already incurred and costs planned for the remainder of the task.
BAC	This field displays the budgeted cost at completion. This field reflects the baseline cost for a task.
VAC	This field displays the variance at completion. This field reflects the difference between the baseline cost and the expected cost for a task [VAC = EAC - BAC].



	Task Name	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	AC (ACWP)	SV	CV	EAC	BAC	VAC	Add New Column
1	Conduct Site Survey	$605.00	$605.00	$580.00	$0.00	$25.00	$580.00	$605.00	$25.00	
2	Develop Blueprints	$4,780.00	$4,780.00	$4,780.00	$0.00	$0.00	$4,780.00	$4,780.00	$0.00	
3	Draft Proposal	$648.00	$648.00	$1,080.00	$0.00	($432.00)	$1,080.00	$648.00	($432.00)	
4	Request Bids	$1,080.00	$1,080.00	$1,080.00	$0.00	$0.00	$1,080.00	$1,080.00	$0.00	
5	Request Permits	$216.00	$216.00	$216.00	$0.00	$0.00	$216.00	$216.00	$0.00	
6	Obtain Permits	$1,480.00	$1,480.00	$1,480.00	$0.00	$0.00	$1,480.00	$1,480.00	$0.00	
7	Obtain Bids	$1,502.50	$1,502.50	$1,462.50	$0.00	$40.00	$1,462.50	$1,502.50	$40.00	
8	Select Subcontractors	$1,400.00	$1,400.00	$1,400.00	$0.00	$0.00	$1,400.00	$1,400.00	$0.00	
9	Complete Planning Phase	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
10	**Build Structure**	**$6,240.00**	**$6,900.00**	**$6,180.00**	**$660.00**	**$720.00**	**$52,131.43**	**$58,205.00**	**$6,073.57**	
11	**Build Foundation**	**$6,240.00**	**$6,900.00**	**$6,180.00**	**$660.00**	**$720.00**	**$9,189.39**	**$10,260.00**	**$1,070.61**	
12	Dig Foundation	$3,600.00	$3,600.00	$3,600.00	$0.00	$0.00	$3,600.00	$3,600.00	$0.00	
13	Smooth Foundation	$2,640.00	$3,300.00	$2,580.00	$660.00	$720.00	$2,580.00	$3,300.00	$720.00	
14	Pour Foundation	$0.00	$0.00	$0.00	$0.00	$0.00	$1,680.00	$3,360.00	$1,680.00	
15	**Construct Frame**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$26,500.00**	**$26,500.00**	**$0.00**	
16	Frame House	$0.00	$0.00	$0.00	$0.00	$0.00	$20,000.00	$20,000.00	$0.00	
17	Frame Garage	$0.00	$0.00	$0.00	$0.00	$0.00	$6,500.00	$6,500.00	$0.00	
18	Install Roof	$0.00	$0.00	$0.00	$0.00	$0.00	$4,400.00	$4,400.00	$0.00	

Viewing earned value data

A screen tip with help on any earned value field is displayed when you point to the top of the column above the field name

You can change earned value options for all tasks using the **Earned Value** button on the **Advanced** page in the Options dialog box. You can change the earned value calculation method and select which saved baseline you want to use for comparison. The default earned value method is **% Complete**, which bases the calculation on duration. The **Physical % Complete** option is a measure that disregards the total or actual duration of the task. For example, it takes 4 days to frame a garage. Using duration, the job is considered 50% complete after 2 days of work. In actuality, three of the four walls are finished since the last wall alone takes 2 days. Using the **Physical % Complete** option, you could mark the job as 75% complete.

To change the earned value method for an individual task only, open the Task Information dialog box and use the **Earned value method** option on the **Advanced** tab.

Step-by-Step

From the Student Data directory, open **HOUSE16.MPP**.
View earned value data.

If necessary, switch to the **Gantt Chart** view, and change the Gantt table view to **Earned Value**

Open the Project Information dialog box and enter a project status date of **9/8/06**.

Drag the split bar as far right as possible to view the earned value data.

VIEWING EARNED VALUE INDICATORS

Discussion

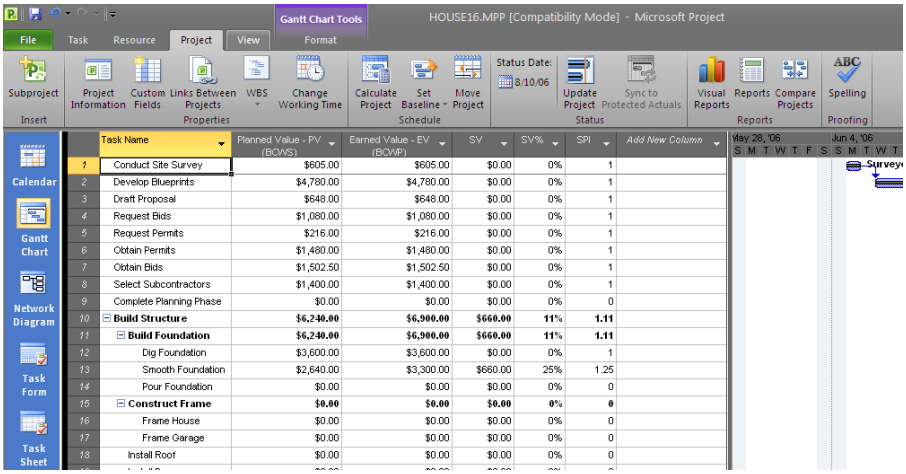
The earned value tables of schedule and cost indicators allow you to analyze the progress and trend of your project. With this information you can judge if you are running ahead of schedule, on schedule, or behind schedule, and if you have enough money to complete the project. You can then make adjustments and prepare for future needs. These tables are available for task views only.

The **Earned Value Cost Indicators** table includes the BCWS, BCWP, CV, BAC, EAC, VAC fields and the additional fields below:

Field	Description
CV%	This field displays a percentage that compares how much it should have cost to achieve the amount of work completed to how much it actually cost [CV% = ((BCWP - ACWP) / BCWP) * 100]. A positive value indicates that a task is under budget, while a negative value indicates a task over budget.
CPI	This field provides a ratio of baseline cost of work to actual cost of work [CPI = BCWP / ACWP]. A value less than 1 indicates a task over budget and a value greater than 1 indicates a task under budget.
TCPI	This field shows the ratio of work remaining to be done to funds remaining to be spent, as of the status date [TCPI = (BAC - BCWP) / (BAC - ACWP)]. A value greater than 1 means that you will have to increase performance for rest of project to stay within budget. A value less than 1 means that you are under budget.

The **Earned Value Schedule Indicators** table includes the BCWS, BCWP, SV fields, and the additional fields below:

Field	Description
SV%	This field displays the percentage that a task is on, over or under schedule [SV% = (SV / BCWS) * 100]. A positive value means that the task is ahead of schedule, while a negative value means that it is behind schedule.
SPI	This field displays a ratio that compares the cost of work performed with the cost of work scheduled [SPI = BCWP / BCWS]. A value greater than 1 means that the work is ahead of schedule, while a value less than 1 means the work is behind schedule.



	Task Name	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	SV	SV%	SPI
1	Conduct Site Survey	$605.00	$605.00	$0.00	0%	1
2	Develop Blueprints	$4,780.00	$4,780.00	$0.00	0%	1
3	Draft Proposal	$648.00	$648.00	$0.00	0%	1
4	Request Bids	$1,080.00	$1,080.00	$0.00	0%	1
5	Request Permits	$216.00	$216.00	$0.00	0%	1
6	Obtain Permits	$1,480.00	$1,480.00	$0.00	0%	1
7	Obtain Bids	$1,502.50	$1,502.50	$0.00	0%	1
8	Select Subcontractors	$1,400.00	$1,400.00	$0.00	0%	1
9	Complete Planning Phase	$0.00	$0.00	$0.00	0%	0
10	**Build Structure**	**$6,240.00**	**$6,900.00**	**$660.00**	**11%**	**1.11**
11	**Build Foundation**	**$6,240.00**	**$6,900.00**	**$660.00**	**11%**	**1.11**
12	Dig Foundation	$3,600.00	$3,600.00	$0.00	0%	1
13	Smooth Foundation	$2,640.00	$3,300.00	$660.00	25%	1.25
14	Pour Foundation	$0.00	$0.00	$0.00	0%	0
15	**Construct Frame**	**$0.00**	**$0.00**	**$0.00**	**0%**	**0**
16	Frame House	$0.00	$0.00	$0.00	0%	0
17	Frame Garage	$0.00	$0.00	$0.00	0%	0
18	Install Roof	$0.00	$0.00	$0.00	0%	0

Viewing the Earned Value Schedule Indicators table

Step-by-Step

View earned value indicators.

If necessary, switch to the **Gantt Chart** view and enter a project status date of **9/8/06**.

Steps	***Practice Data***
1. Select the **View** tab. *The **View** Ribbon appears.*	Click the **View** tab
2. Click on the arrow at the bottom of the **Table** button. *The **Table** list appears.*	
3. Select the **More Tables** command. *The More Tables dialog box opens.*	Click **More Tables...**
4. Select **Earned Value Cost Indicators** or **Earned Value Schedule Indicators** in the **Tables** list box. *The table is selected.*	Click **Earned Value Schedule Indicators**
5. Select **Apply**. *The table is applied to the view and the earned value data appears.*	Click **Apply**

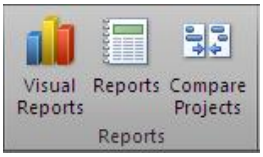
If necessary, drag the split bar to the right to view the **SV%** and **SPI** fields. Change the project status date to **10/27/06**. Scroll to view the earned value indicators for tasks 20 through 29. Tasks with a negative **SV%** value and a **SPI** value less than 1 are behind schedule.

Practice the Concept: Apply the **Earned Value Cost Indicators** table.

CREATING A REPORT

Discussion

Microsoft Project provides a variety of reports you can use to view and distribute project information. On the Project tab. The Reports Group has several buttons for reporting options.



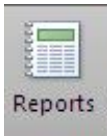
The Reports Group on the Project Tab

When you click the Reports Button you can choose reports from the following categories: **Overview**, **Current**, **Costs**, **Assignments**, **Workload**, and **Custom**.

The **Overview** category provides reports that reflect summary information for the entire project, such as summary tasks and working days. The **Current** category offers reports that contain a variety of task information, such as tasks starting soon, in progress, and complete. The **Costs** category contains reports that reflect a variety of cost information, such as overbudget tasks and resources. The **Assignments** category provides reports containing resource assignment information, such as who does what, when, and overallocated resources. The **Workload** category offers two types of reports: task usage and resource usage. The **Custom** category allows you to create custom reports that reflect the specific information you need.

Step-by-Step

Create a report.

Steps	***Practice Data***
1. Select the **Project** tab. *The **Project** Ribbon appears.*	Click the **Project** tab
2. Select the **Reports** button. *The Reports dialog box opens.*	

Steps	*Practice Data*
3. Double-click the desired report category. *The report dialog box for the selected category opens with the available reports displayed.*	Double-click **Costs...**
4. Double-click the desired report. *The report appears in the Backstage View Preview Pane.*	Double-click **Overbudget Resources**
5. Click the **Zoom** button in the lower right or click on the preview area to zoom in. *The view is magnified.*	Click in the lower right hand corner of the screen to zoom in

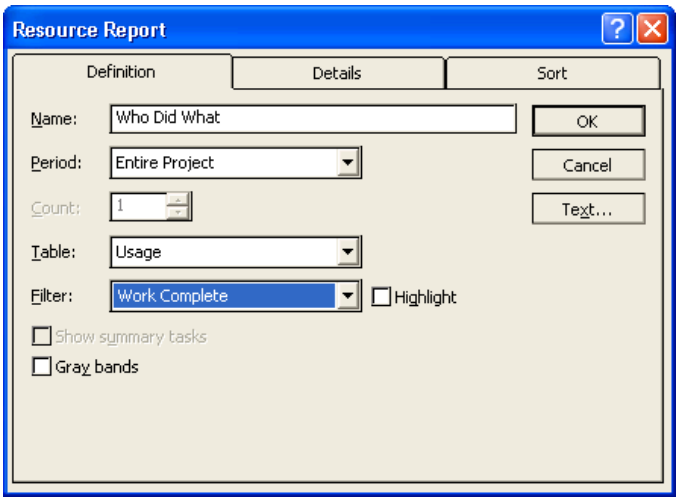
If necessary, click the **Zoom** button to magnify the report and scroll to read it. Notice that the **Electrician**, **Contracting Specialist**, **Cable Specialist** and **Laborer** resources are over budget. Select **Close** after reading the report and then select **Close** to close the Reports dialog box.

CREATING A CUSTOM REPORT

Discussion

You can create custom reports by creating a new report or by copying an existing report and modifying it. Custom reports reflect only the information you need. The **Base Calendar** and **Project Summary** reports are the only reports you cannot copy and modify.

When you create a custom report, you work in the Reports dialog box, which has three tabbed pages. On the **Definition** page, you type a name for the report, select the time period to include, and select the table and filter to apply. You can select a predefined table or filter, or use a custom one you created. This page also includes options to highlight the items that meet the filter criteria, print gray bands between tasks or resources, and include summary tasks. On the **Details** page, you can select the task, resource, or assignment details you want to include in the report, as well as how you want them to appear. The options available on this page vary depending on the type of report. On the **Sort** page, you can choose the field(s) by which you want to sort the report information and the sort direction.



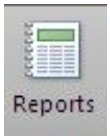
Creating a custom report

> You can also create a custom report by editing an existing report. Select the report in the Custom Reports dialog box, select the **Edit** button, and then make the desired changes. The changes to the report only apply to the current file; the same report in other files is not affected.

> To create a new custom report, select **New** in the Custom Reports dialog box, select the report type, and then select **OK**. You can then name the report and set its properties in the <***report type***> dialog box.

Step-by-Step

Create a custom report.

Steps	***Practice Data***
1. Select the **Project** tab. *The **Project Ribbon** appears.*	Click the **Project** tab
2. Select the **Reports** button. *The Reports dialog box opens.*	
3. Double-click the **Custom** category. *The Reports dialog box closes and the Custom Reports dialog box opens.*	Double-click **Custom...**

Steps	***Practice Data***
4. Select the report you want to copy in the **Reports** list box. *The desired report is selected.*	Scroll as necessary and click **Who Does What**
5. Select **Copy**. *The appropriate report dialog box opens with the **Definition** page displayed.*	Click **Copy...**
6. Select the text in the **Name** box. *The text is selected.*	Drag to select the text in the **Name** box
7. Enter the name of the report. *The desired name appears in the **Name** box.*	Type ***Who Did What***
8. Select the **Period** list. *A list of available time periods appears.*	Click **Period**
9. Select the desired time period. *The desired time appears in the **Period** box.*	Click **Entire Project**
10. Continue to select options on the **Definition** page as desired. *The desired options are selected.*	Select **Work Complete** from the **Filter** list.
11. Select the **Details** tab. *The **Details** page appears.*	Click the **Details** tab
12. Select the desired options on the **Details** page. *The desired options are selected.*	Click ☐ **Cost** below **Assignment**
13. Select the **Sort** tab. *The **Sort** page appears.*	Click the **Sort** tab
14. Select the **Sort by** list. *A list of sort options appears.*	Click **Sort by**
15. Select the desired sort option. *The desired sort option appears in the **Sort by** box.*	Scroll as necessary and click **Name**
16. Select the **Ascending** or **Descending** option to indicate the sort order. *The desired sort order option is selected.*	Click ○ **Ascending**, if necessary

Steps	***Practice Data***
17. Select **OK**. *The report dialog box closes and the custom report is selected in the Custom Reports dialog box.*	Click **OK**
18. Select **Preview** to view the report. *The custom report appears in the Backstage View Preview Pane.*	Click **Preview**

Click the **Zoom** button to magnify the report and scroll as necessary to read it. Select **Close** after reading the report and then continue to select **Close** to close all open dialog boxes.

CREATING A CROSSTAB REPORT

Discussion

A crosstab report allows you to compile task or resource information across a specified time period. The cost or work information for the tasks or resources is listed for each division of the time period. For example, you can display work information per week by resource.

Creating a crosstab report is similar to creating other reports. You create a crosstab report in the Crosstab Report dialog box, which has three tabbed pages. The **Definition** page varies slightly as you select row and column options, as well as the calculated field for the body of the report. The **Details** page also varies slightly in the type of options available. You can use the options on the **Details** page to change the appearance of the report by adding row and column totals and gridlines. On the **Sort** page you can choose the field(s) by which you want to sort the report information and the sort direction.

Task Costs by Month as of Mon 12/16/02
house16

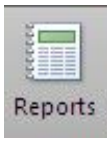
	June	July	August	September	October	November	December
Develop Blueprints	$4,780.00	$4,780.00	$4,780.00	$4,780.00	$4,780.00	$4,780.00	$4,780.00
Draft Proposal	$1,080.00	$1,080.00	$1,080.00	$1,080.00	$1,080.00	$1,080.00	$1,080.00
Request Bids	$216.00	$1,080.00	$1,080.00	$1,080.00	$1,080.00	$1,080.00	$1,080.00
Obtain Permits		$1,480.00	$1,480.00	$1,480.00	$1,480.00	$1,480.00	$1,480.00
Obtain Bids		$1,462.50	$1,462.50	$1,462.50	$1,462.50	$1,462.50	$1,462.50
Select Subcontractors		$1,277.50	$1,400.00	$1,400.00	$1,400.00	$1,400.00	$1,400.00
Frame House			$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00
Install Roof				$4,400.00	$4,400.00	$4,400.00	$4,400.00
Install Windows				$4,635.00	$4,635.00	$4,635.00	$4,635.00
Install Siding				$4,440.00	$7,400.00	$7,400.00	$7,400.00
Initial Plumbing					$6,750.00	$6,750.00	$6,750.00
Initial Electricity					$7,400.00	$7,400.00	$7,400.00
Insulation					$7,920.00	$7,920.00	$7,920.00
Drywall					$1,244.44	$2,800.00	$2,800.00
Flooring						$3,000.00	$3,000.00
Landscaping						$1,500.00	$1,500.00
Total	$6,076.00	$11,160.00	$31,282.50	$44,757.50	$70,031.94	$76,087.50	$76,087.50

Viewing a crosstab report

Step-by-Step

Create a crosstab report.

Create a new custom filter called **Tasks with Durations Greater Than 3 Days**. Select the field name **Duration**, select the test criteria **is greater than**, and enter **3** to indicate the value. Close the More Filters dialog box without applying the new filter.

Steps	***Practice Data***
1. Select the **Project** tab. *The **Project** Ribbon appears.*	Click the **Project** tab
2. Select the **Reports** button. *The Reports dialog box opens.*	
3. Double-click the **Custom** category. *The Custom Reports dialog box opens.*	Double-click **Custom...**
4. Select **New**. *The Define New Report dialog box opens.*	Click **New...**
5. Select **Crosstab** in the **Report type** list box. *The **Crosstab** option is selected.*	Click **Crosstab**
6. Select **OK**. *The Define New Report dialog box closes and the Crosstab Report dialog box opens.*	Click **OK**
7. Select the text in the **Name** box. *The text is selected.*	Drag to select the text in the **Name** box
8. Enter a name for the crosstab report. *The name appears in the **Name** box.*	Type ***Task Costs by Month***
9. Select the **Row** list. *The **Tasks** and **Resources** options appear.*	Click **Row**
10. Select **Tasks** or **Resources**. *The desired option appears in the **Row** box.*	Click **Tasks**
11. Select the **Column** list. *The **Column** list appears.*	Click **Column**

Steps	***Practice Data***
12. Select the time period. *The desired time period appears in the **Column** box.*	Click **Months**
13. Select the calculation list that appears at the intersection of the row and column. *A list of options appears.*	Click the calculation list that appears at the intersection of the row and column
14. Select the calculation option. *The desired calculation option is selected.*	Click **Cumulative Cost**
15. Select the **Filter** list, if desired. *A list of available filters appears.*	Click **Filter**
16. Select the desired filter. *The desired filter is selected.*	Click **Tasks with Durations Greater Than 3 Days**
17. Select the **Details** tab. *The **Details** page appears.*	Click the **Details** tab
18. Select the desired options under **Show**. *The desired options are selected.*	Click **Column totals**
19. Continue to select options on the **Details** page as desired. *The desired options are selected.*	Click **Between tasks** below **Gridlines**
20. Select the **Sort** tab. *The **Sort** page appears.*	Click the **Sort** tab
21. Select the **Sort by** list. *A list of sort options appears.*	Click **Sort by**
22. Select the field by which you want to sort. *The desired field appears in the **Sort by** box.*	Scroll as necessary and click **Start**
23. Select the **Ascending** or **Descending** option. *The desired option is selected.*	Click **Ascending**, if necessary
24. Select **OK**. *The Crosstab Report dialog box closes and the new report is selected in the Custom Reports dialog box.*	Click **OK**

Steps	*Practice Data*
25. Select **Preview**. *The new crosstab report appears in the Backstage View Preview Pane.*	Click **Preview**

Click the **Zoom** button to magnify the report and scroll as necessary to read it. Select **Close** after reading the report. With the **Task Costs by Month** report still selected, click **Edit**. Change the filter on the **Definition** page to **All Tasks** and preview the report again. **Close** all open dialog boxes.

USING THE BACKSTAGE VIEW PREVIEW PANE

Discussion

Before you print a view or a report, you can preview it. The Print Preview window displays the view as it would look on the printed page. This view allows you to make changes to the layout before you print, saving time and paper. When you create a report, it automatically appears in the Backstage View Preview Pane. When you create a custom report, you need to select the **Preview** button in the Custom Reports dialog box to open the Backstage View Preview Pane.

The Office 2010 Backstage View preview window has a special set of tools, in the lower right hand corner of the preview pane, that enable you to manipulate the view to magnify information; page right, left, up, and down; and display multi-page views.

Project views, like reports, can also be printed. To print the Gantt Chart view, arrange the screen the way you'd like it to appear on the printed page, select the **File** tab and click Print.

You can also zoom the Backstage View Preview Pane with the mouse pointer. To zoom in, click the mouse pointer, which appears as a magnifying glass with a plus sign (+), on the text you want to enlarge. The plus sign on the mouse pointer changes to a minus sign (-). To zoom out, click the mouse pointer anywhere in the window.

Step-by-Step

Use the Backstage View (Print Preview) Page.

Create the **Who Does What When** report that appears in the **Assignments** category. Notice that it opens in the Backstage View (Print Preview).

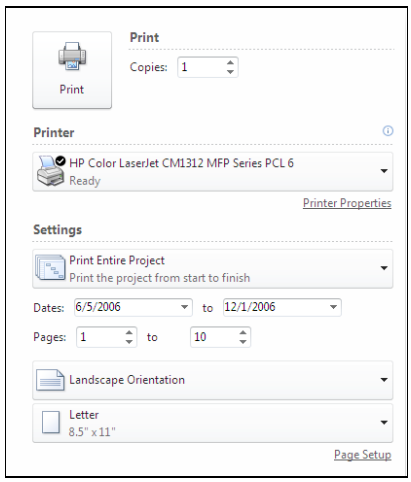
Steps	***Practice Data***
1. Click the **Zoom** button to read the report. *The report is magnified.*	Click
2. Click anywhere in the window to zoom out. *The report returns to full page view.*	Click anywhere in the window
3. Click the **Page Right** button or the **Page Down** button to move to a following page in a multi-page view. *The next page appears.*	Click or
4. Click the **Page Left** button or the **Page Up** button to move to a previous page. *The previous page appears.*	Click or
5. Click the **Multiple Pages** button to view more than one page. *Multiple pages appear.*	Click
6. Click the **One Page** button to return to a single-page view. *One page appears.*	Click
7. Click the Project Tab to Return to the project.	Click the **Project** tab

Select **Close** to close the Reports dialog box.

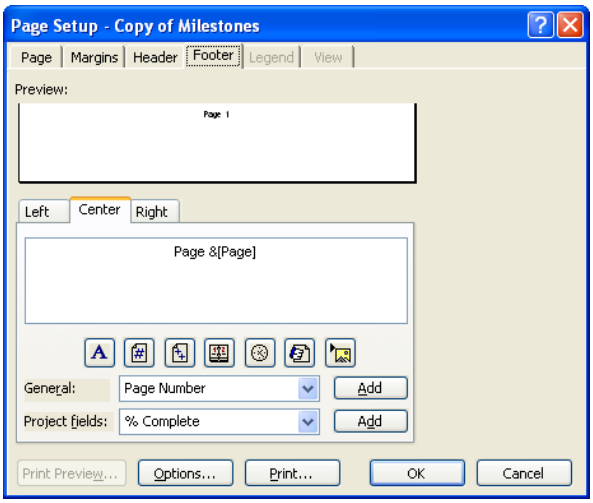
CHANGING PAGE SETUP OPTIONS

Discussion

Before printing a report, you may need to make some changes to the page setup. When you create a report, it either appears automatically in the Backstage View with the Print Preview pane, with basic printing options displayed as shown below:



For additional printing options, click the Page Setup link to open the page setup dialog box as shown below. You can change the orientation and margins, as well as add a header and/or footer to your reports. You can type text, or you can enter codes to print the current date, time, file name, or page number. In addition, you can add project-level fields, such as **% Complete**, to a header or footer as desired.



The Page Setup dialog box

Step-by-Step

Change page setup options.

Create the **Overbudgeted Resources** report that appears in the **Costs** category. Notice that it opens in the Backstage View Preview Pane window.

Steps	***Practice Data***
1. Select **Page Setup** from the Backstage View Preview Pane window. *The Page Setup dialog box opens.*	Click **Page Setup...**
2. Select the **Page** tab. *The **Page** page appears.*	Click the **Page** tab, if necessary
3. Select the **Portrait** or **Landscape** option under **Orientation**. *The desired orientation option is selected.*	Click ○ **Landscape**, if necessary
4. Select the **Footer** tab. *The **Footer** page appears.*	Click the **Footer** tab
5. Select the desired alignment tab. *The desired alignment page appears.*	Click **Right**
6. Select the **General** or **Project fields** list at the bottom of the **Footer** page. *A list of footer options appears.*	Click **General**
7. Select the desired option. *The desired option is selected.*	Scroll as necessary and click **Project Current Date**
8. Select the **Add** button next to the corresponding option. *The desired option appears it the preview area.*	Click **Add** next to the **General** option
9. Select **OK**. *The Page Setup dialog box closes and the desired page setup changes appear in the Backstage View Preview Pane.*	Click **OK**

Click the **Project** Tab to return to the project.
Close **HOUSE16.MPP**.

LESSON 8 -
FINALIZING A PROJECT

In this lesson, you will learn how to:

- Mark tasks complete
- Correct actual data
- Analyze final data
- Use final data in a new project
- Copy task names to a new project

MARKING TASKS COMPLETE

Discussion

When your project is finished, all tasks should be marked as 100% complete. Often, some tasks may be overlooked and not marked complete, even though the project has ended. You should mark all tasks as 100% complete before beginning your analysis of the actual information versus baseline information.

Step-by-Step

From the Student Data directory, open **HOUSE17.MPP**.
Mark tasks complete.

If necessary, switch to the **Gantt Chart** view.

Filter for **Incomplete Tasks** and then display the **Task Ribbon**.

Steps	***Practice Data***
1. Select all the incomplete tasks. *All the incomplete tasks are selected.*	Click the **Select All** button (the gray button at the intersection of the **ID** column and field name row)
2. Mark all remaining tasks as **100% Complete**. *The selected tasks are marked complete.*	Click the **Task** tab then Click 

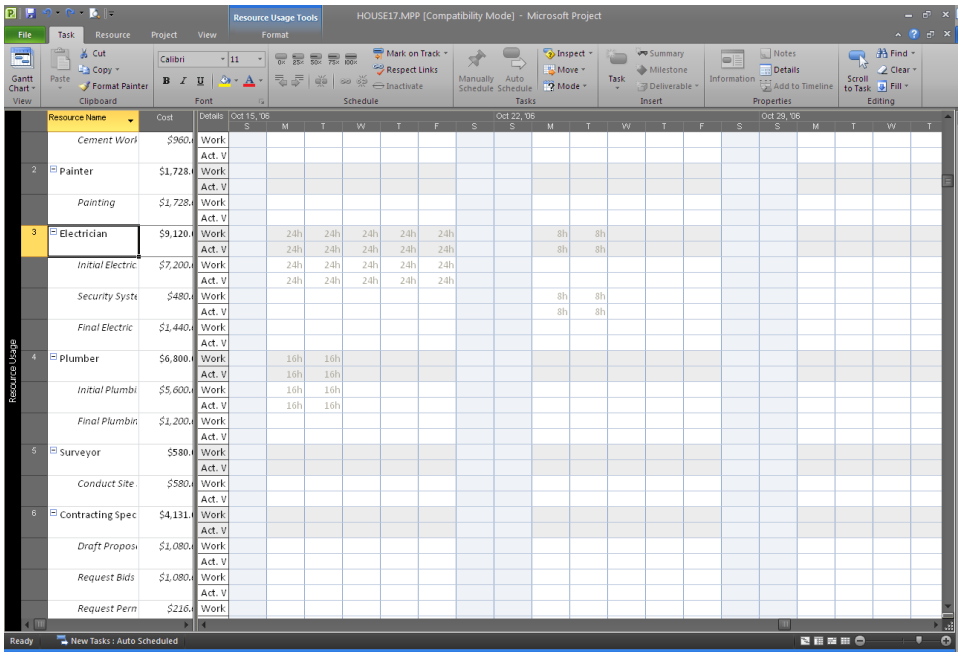
Notice that a check mark now appears to the left of the selected tasks. Return to the **View** Ribbon and filter again for all tasks.

CORRECTING ACTUAL DATA

Discussion

The project is complete when all tasks are marked as 100% complete. Microsoft Project calculates the duration, resource usage, and costs for the individual tasks and for the project in its entirety. All of these calculations are based on the available schedule information. This information may or may not reflect what actually

happened on the project. You may need to enter actual information manually in order to get an accurate picture of the final project information. For example, a task may have had a duration of three days, but the resources only worked on the task for six hours on the last day. In this situation, you would need to adjust the data to reflect actual hours, which would alter your cost information, making it more accurate. Manually entering actual information should be done before comparing the actual information to the baseline information.



Correcting actual data

Step-by-Step

Correct actual data.

Switch to the **Resource Usage** view and apply the **Cost** table. Drag the split bar so that only the **Resource Name** and **Cost** fields appear in the left pane. Scroll down as necessary to view the resource cost (**3 Electrician**) for the **Initial Electricity** task, which is **$7,200.00**. Scroll the right pane as necessary to display the work values for the week of **Oct 15, '06**.

Steps	*Practice Data*
1. Select the **Format** tab. *The **Format** Ribbon appears.*	Click **Format**
2. Select the desired field. *The desired field is added to the current view.*	Click **Actual Work**
3. Select the field containing the value you want to correct. *The desired field is selected.*	Scroll as necessary and click **24h** that appears in **Act. W** field in the **T** (Tuesday) column for the week of **Oct 15, ′06** (for the **Initial Electricity** task)
4. Enter the actual data. *The actual data appears in the selected field.*	Type ***18h***
5. Press **[Enter]**. *The correct value is entered into the selected field.*	Press **[Enter]**

Notice that the resource cost for the **Initial Electricity** task is now **$7,020.00**, a difference of $180 dollars.

Practice the Concept: Scroll down as necessary to view the resource cost (**4 Plumber**) for the **Initial Plumbing** task, which is **$5,600.00**. Scroll the right pane to view the week of **Oct 8, ′06**. Change the work values in the **Act. Work** fields for Wednesday (**W**) and Friday (**F**) from **16h** to **10h**. Notice that the resource cost is now **$5,000.00**, a difference of $600.

Switch to the **Gantt Chart** view.

ANALYZING FINAL DATA

Discussion

After a project has been completed, it is recommended that you analyze the final data and review any problems that may have occurred during the project. If you are able to learn the causes of these problems, then you can prevent them from happening on future projects. The areas that should be reviewed include actual versus baseline dates, durations, costs, and work; as well as recurring problem areas.

Once all tasks are marked complete and the actual information is correct, you can compare baseline data versus actual data for resource usage, costs, dates, and durations. You can determine how accurate the baseline forecasts were and what

actions should be taken in the future on similar projects. You should review large variances to determine the cause of the problem so that you can prepare more accurate baseline data for future projects.

You do not necessarily have to review every task in a project, but you should review those tasks that had the largest cost, schedule, and work variances. If the project did not go as planned, you could ask yourself questions such as:

- What caused the continued cost growth or schedule slippage?
- Were the problems a result of internal management factors, specification changes to the contract, or economic factors such as inflation?
- What can prevent these problems from occurring in future projects?
- Will employing more highly-skilled labor or using overtime be a solution?
- Was a management reserve cost set aside at the beginning of the project to handle problem areas?

The project manager should be aware of the problems in a project so that they can control future projects.

Step-by-Step

Analyze final data.

If necessary, switch to the **Gantt Chart** view. Drag the split bar as far right as possible.

Steps	***Practice Data***
1. Select the **View** Tab. *The **View** Ribbon appears.*	Click the **View** tab
2. Click the **Tables** button. *The **Table** list appears.*	
3. Select the desired table. *The desired table is applied to the view.*	Click **Work**

Scroll to the **13 Smooth Foundation** task. View the **Variance** field. Notice that due to good weather, the task took **24** hours less than planned. Notice that the **3 Draft Proposal** task took **16** hours more than planned.

Practice the Concept: Apply the **Cost** table to the view. View the **Variance** field and notice that the **13 Smooth Foundation** task had a cost variance of **$720** less than the baseline cost. However, the **3 Draft Proposal** task cost **$432** more than planned.

Apply the **Variance** table to the view. The **Finish Var.** field for the **13 Smooth Foundation** task indicates that the task ended **.5** work days earlier than planned. View the **Start Var.** and **Finish Var.** fields for the **17 Frame Garage** task. Although the task started **1.5** days earlier than planned, it finished **.5** day later than planned.

Switch to the **Resource Sheet** view and apply the **Cost** table. View the **Variance** field and notice that the cost of all tasks assigned to the **4 Plumber** was **$600** less than planned. Apply the **Work** table. The **Variance** field for the **4 Plumber** shows that it took **12** hours less than planned to complete the assigned work.

Switch to the **Gantt Chart** view, apply the **Entry** table, and drag the split bar back to the right of the **Duration** field.

USING FINAL DATA IN A NEW PROJECT

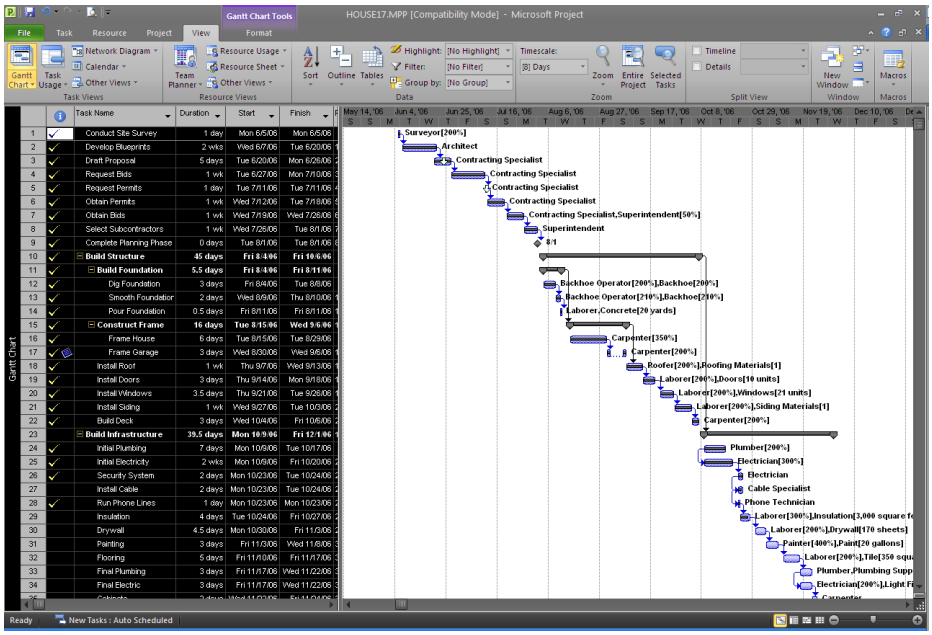
Discussion

When you are starting a new project that is similar to a completed project, you can copy all the information from the completed project into the new project. After you copy the data, you can edit, insert, and delete information as desired.

After copying a completed project, you should change all the tasks from 100% complete to 0% complete. You can update the durations, start dates, and links to create a baseline plan based on the final results of the completed project. In addition, you can update the resource and assignment information to reflect the needs of your new project. When you copy project information, the resource names from the completed project appear in the **Resource Sheet** view; however, each one is assigned a maximum unit value of **100%**. Other resource information, such as costs, are not copied.

When you copy project information, you can enter a new project start or finish date, but you will be advised of conflicts with any dates that have constraints applied to them. For this reason, it is recommended that you remove all constraints before you enter a start or finish date for your new project. Once you remove all constraints and enter the new start or finish date, all task dates are updated accordingly. You can then constrain and modify the tasks in your new project file as desired.

When tasks are copied, the baseline values for those tasks are also copied. If you do not save a new baseline, the baseline dates from the original file from which you copied the data appear in the baseline fields, but have no effect on your project. When you are ready to save a baseline later, you can save it and all the baseline fields will be updated to reflect the current plan for the new project.



Using final data in a new project

When you first copy the data to your new project file, all tasks reflect the original project dates. Once you mark all tasks as **0%** complete and remove the constraints, the tasks reflect dates based on the current date. You can change the dates by entering a project start or finish date in the Project Information dialog box.

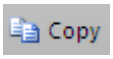
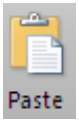
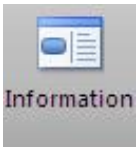
Before you copy final data and paste it into a new project, you should open the Resource Leveling dialog box and verify that **Leveling calculations** is set to **Manual**. The procedure may not work properly if this option is set to **Automatic**.

To view tasks with constraints, select the **Constraint Type** option from the **Group By** box on the **View** ribbon. To view tasks with deadlines, select the **Tasks With Deadlines** option from the **Filter** list on the **View** ribbon.

Step-by-Step

Use final data in a new project.

If necessary, switch to the **Gantt Chart** view. Display the **Task Ribbon**.

Steps	***Practice Data***
1. Select the tasks you want to copy. *The tasks are selected.*	Drag the to select the row headings for the **1 Conduct Site Survey** task through the **39 Cement Work** task
2. Click the **Copy Task** button. *The selected tasks are copied to the Windows Clipboard.*	Click 
3. Create a new project. *A new project file opens.*	Click **File**, **New**, then double click **Blank Project**
4. Click the **Paste** button. *The tasks appear in the **Gantt Chart** view of the new project file or a Microsoft Project dialog box opens warning you about a task change.*	Click 
5. If a warning box opens, select **OK** to confirm changes made to task durations. *The tasks appear in the **Gantt Chart** view of the new project file.*	Click **OK**
6. Select all the tasks you copied. *All the tasks are selected.*	Click the **Select All** button (the gray button at the intersection of the **ID** column and field name row)
7. Click the **0% Complete** button. *The check marks to the left of all the copied, completed tasks disappear and any indicators reappear.*	Click 
8. To remove constraints and deadlines on all copied tasks, select the tasks and click the **Task Information** button on the **Task Ribbon**. *The Multiple Task Information dialog box opens.*	Click 
9. Select the **Advanced** tab. *The **Advanced** page appears.*	Click the **Advanced** tab

Steps	*Practice Data*
10. Remove all constraints and deadlines. *A list of constraint types appears.*	Select the **Constraint type** list and select **As Soon As Possible**. Select the **Deadline** box and type **NA**.
11. Select **OK**. *The Multiple Task Information dialog box closes, all constraints and deadlines are removed, and all constraint indicators disappear.*	Click **OK**

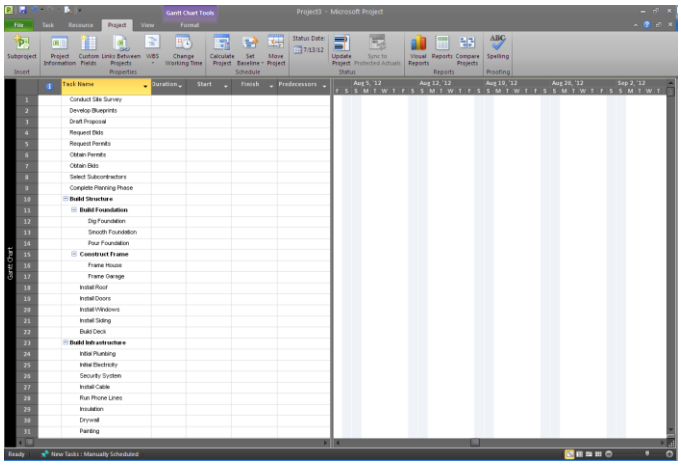
Click any task to deselect the selected tasks. Click the Project Tab, and open the Project Information dialog box. Enter a project start date of **1/1/2012**. Drag the split bar to view the **Start** and **Finish** date fields. Notice that all dates were updated accordingly. Save the new project file to the student data folder as **Build** and then close it.

Close **BUILD.MPP**.

COPYING TASK NAMES TO A NEW PROJECT

Discussion

You can also begin a new project by copying the task names from a previous project. When you copy only the task names, the task durations are not included. All copied tasks appear in the new project file with an estimated duration of one day. The advantage of copying only the task names is that you can then create a fresh baseline plan. You can set task durations, link tasks, and apply constraints, as if you had typed the tasks to start a new project. In addition, you can create and assign only those resources you need for this project.

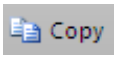
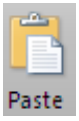


Copying task names to a new project

Step-by-Step

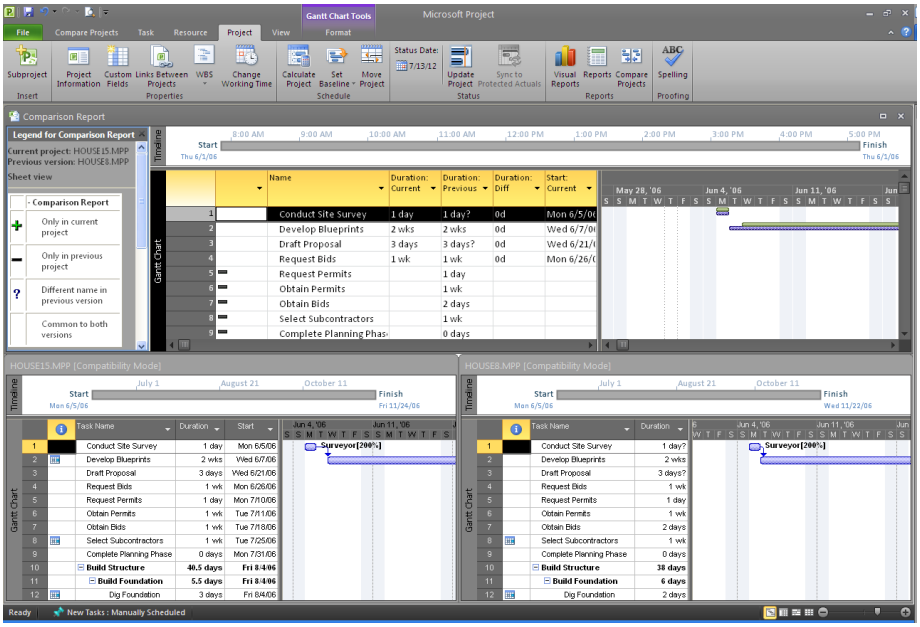
Copy task names to a new project.

Switch to the **Gantt Chart** view, if necessary.

Steps	***Practice Data***
1. Select the task names in the **Task Name** column that you want to copy to create a new file. *The tasks are selected.*	Drag to select the task names of the **1 Conduct Site Survey** task through the **39 Cement Work** task
2. Click the **Copy Cell** button. *The selected tasks are copied to the Windows Clipboard.*	Click 
3. Create a new project. *A new project file opens.*	Click **File**, **New**, then double click **Blank Project**
4. Select the first field in the **Task Name** column.	Click the first field in the **Task Name** column
5. Click the **Paste** button. *The task names appear in the **Task Name** column*	Click 

Notice that none of the tasks are linked or constrained as they were in the original file.
Close the file without saving it.
Close **HOUSE17.MPP**.

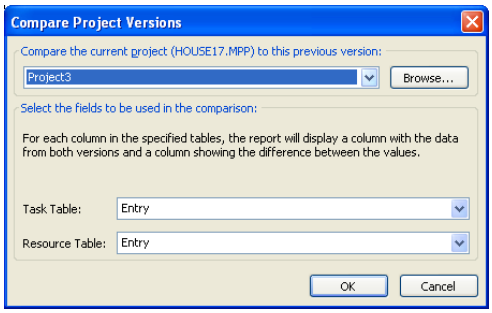
CREATING A PROJECT COMPARISON REPORT



The Project Comparison Report

Discussion

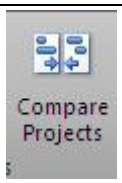
Sometimes you may want to compare one project to another or a given project to an earlier version of itself. The Compare Projects button on the Project tab allows you to see the differences between any two selected projects. The Compare Project dialog box allows you to select the two projects, and the specific data you wish to compare by selecting one Task and one Resource table to be included in the comparison report. When you compare two projects, Microsoft Project creates a third project named "Comparison Report" that identifies the differences between the two projects you selected, and tags those changes with special symbols to identify the type of difference. The Gantt bars for each project will be color coded and displayed on a common Gantt chart.

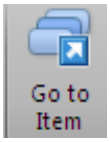
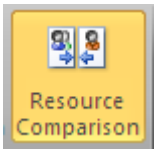
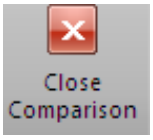


Step-by-Step

Compare two projects.

Open **HOUSE15.MPP**.
Click to select the **Project** tab, if necessary.

Steps	***Practice Data***
1. Click the **Compare Projects** button to select a second project.	Click 
2. Browse to select the second project	Click the Browse... button and select the **House8.mpp**
3. Select the data tables that you wish to compare	Change both the Task Table: and the Resource Table: drop down lists to **Entry**
4. Click **OK** to begin the Project Comparison. *A new project entitled Project Comparison is created, and a split window view opens, displaying the comparison Gantt chart at the top of the screen (in Task Comparison view), and the two selected projects at the bottom of the screen.*	Click **OK**
5. Change the start date for the newly created project to match the compared projects	Open the project information dialog for the Comparison Project and set the **Project start date** to **6/1/2006** Click the **Compare Projects** tab to return to the comparison view
6. Scroll through the Project Comparison Report at the top of the screen, noting the Comparison Legend at the left, and the appropriate symbols in the indicators column	In the Comparison Report Gantt Chart at the top of the screen, click on the row selector for **Task 4 Request Bids**

Steps	***Practice Data***
7. View the same task in all three projects. *The task is display in all three project*	Click 
8. Switch to **Resource Comparison** *The view changes to show you the Resource comparison at the top of the screen, and each project's resource sheet at the bottom of the screen.*	Click 
9. Close the Comparison Tab *The Comparison view tab is closed, and you are returned to the Comparison Report Project.*	Click 
10. Close the Comparison Report	**Close and Save** the Comparison Report project adding **today's date** to the end of the file name.
11. Close the remaining open project files	**Close** all remaining open projects.

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