



Pure Training Center

# Project management using MS project Training series

# What is a project?

Project is an undertaking that:

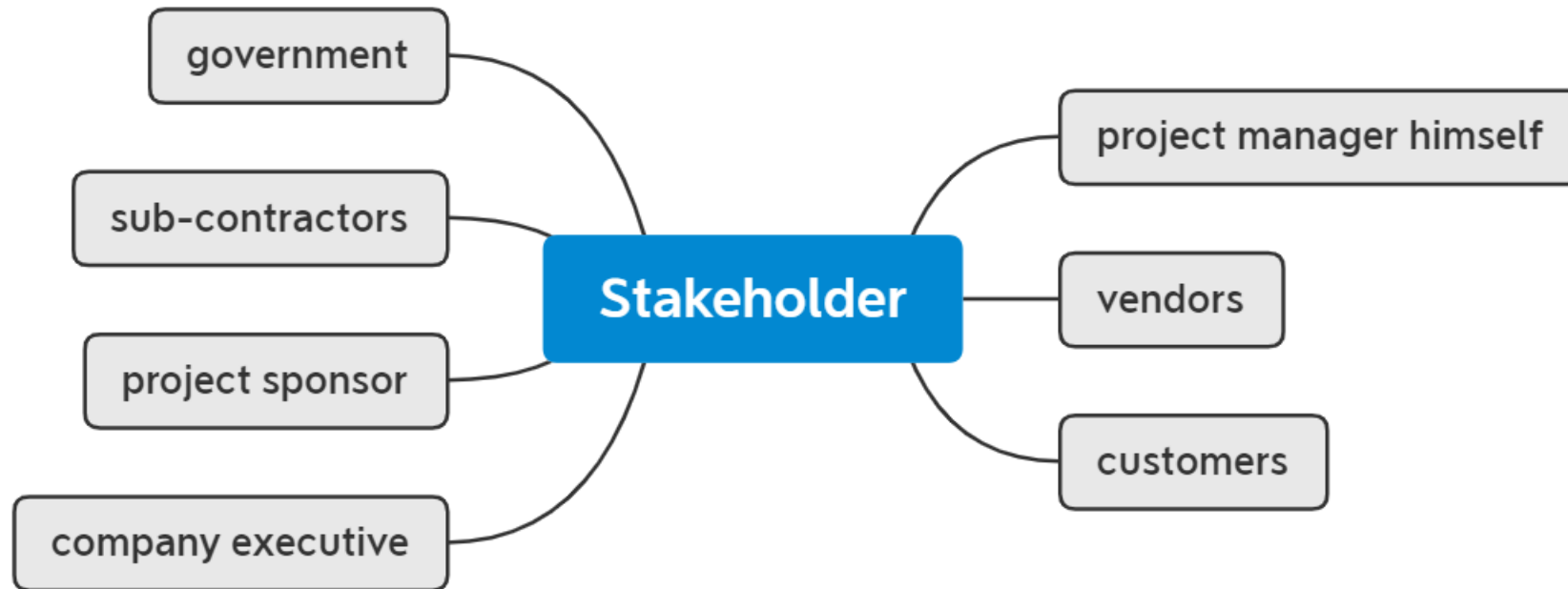
- Involves a sequence of activities with start and finish dates
- Involves work, cost, and material resources
- Aimed to achieve a set of well defined deliverables (outcomes)
- Deals with constraints (time, cost, and scope)

- Project has start and end  
- Operation is continuous work

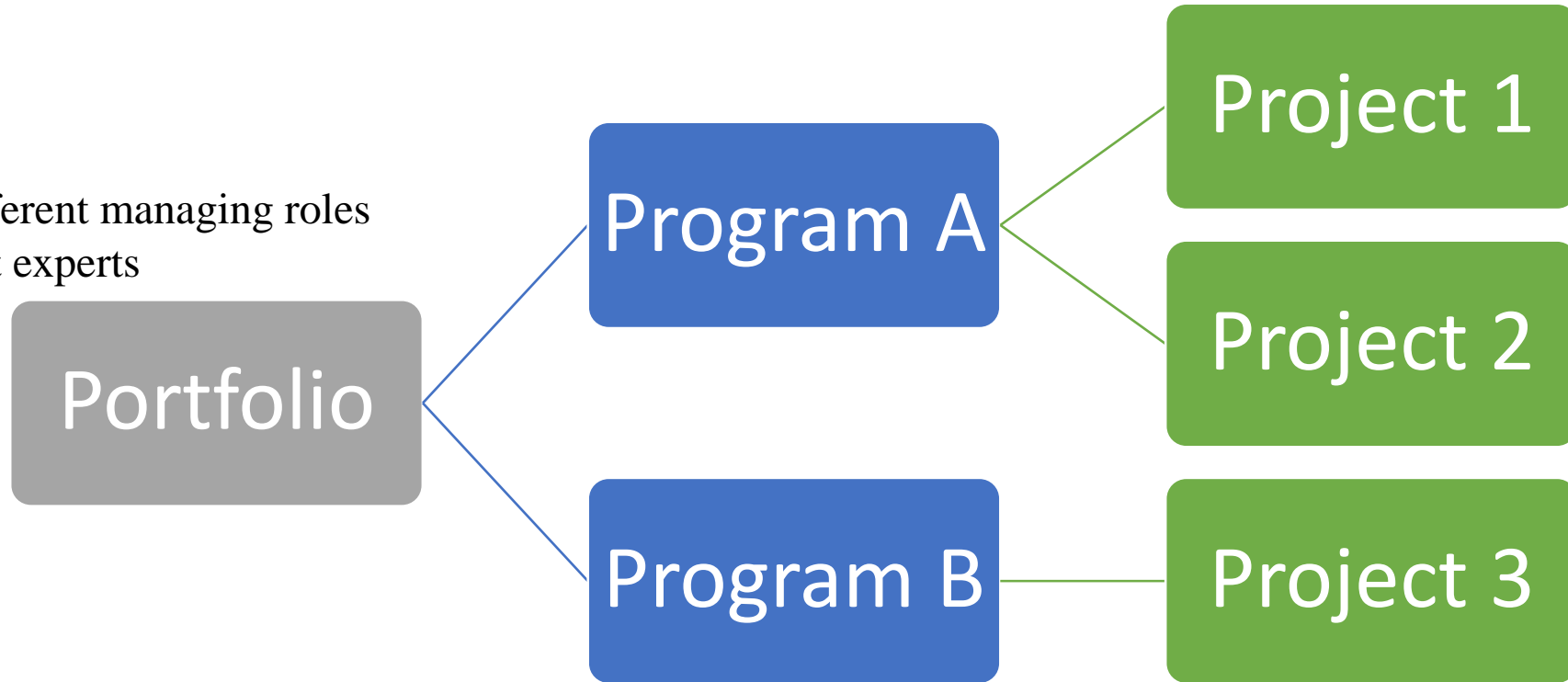
A project is considered successful when it fully meets the expectation of the project stakeholders

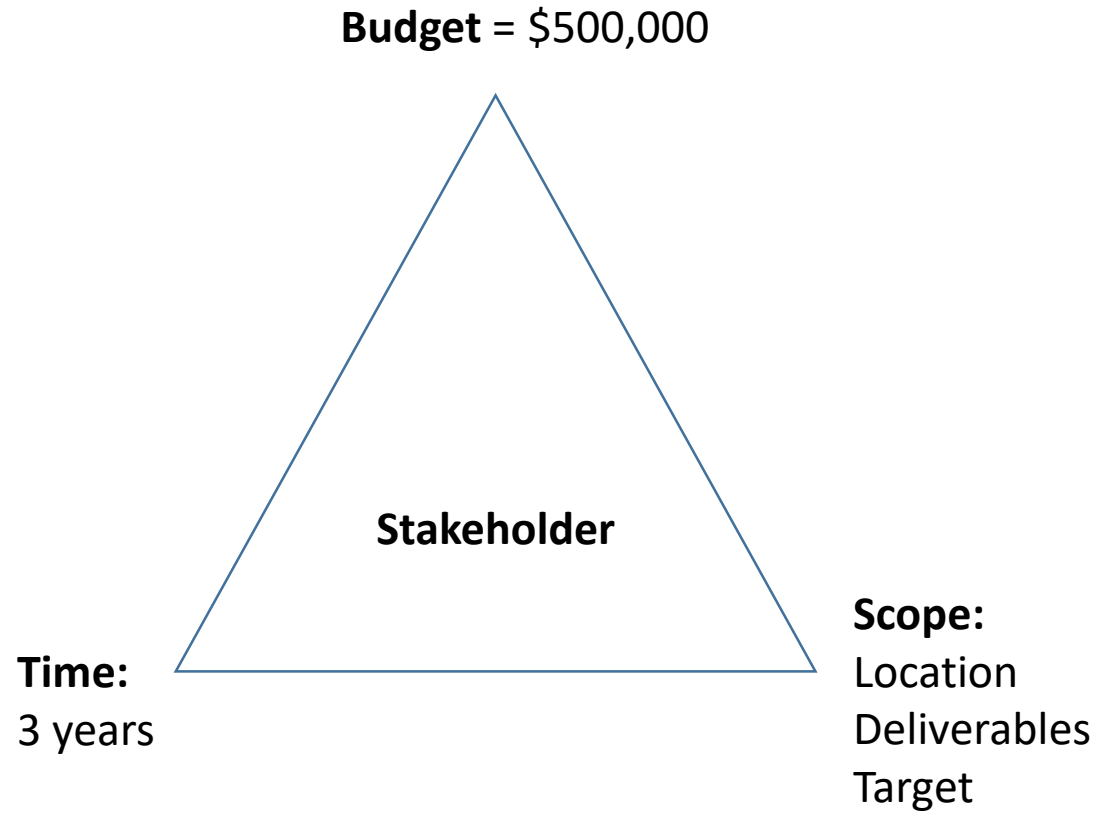
A project management is the application of project manager's skills and tools to project activities  
In order to meet project requirements

A project stakeholder is any entity that has an interest in the project



Portfolio is different managing roles  
Under different experts





## Human competency

*Soft skills* acquired through environment  
And experience

- Communication skills
- Time management
- Leadership and interpersonal
- File management
- People centered manager
  - Listens to his team
  - Consultative
  - Motivating
  - Flexible
  - Willing to delegate
  - Empowering with creative ideas
  - Negotiation skills
  - Influencing stakeholders

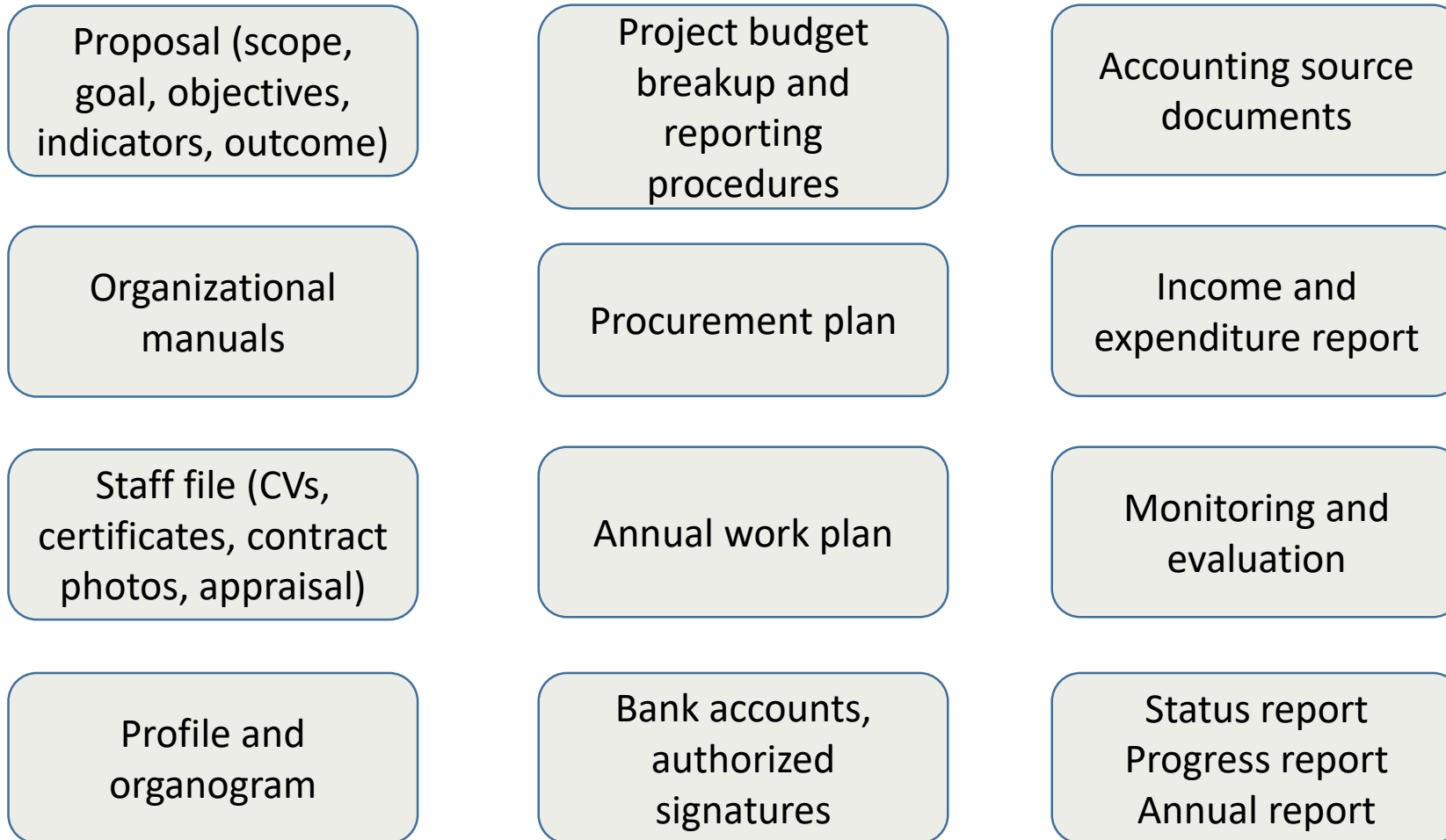


## Project competency

*Hard skills* acquired through  
College or training

- Project scope (requirement, outcome, stakeholder, etc.)
- Management tools (proposal, budget, PD, contracts, etc.)
- Sharing project to stakeholder meetings
- Annual work plan and resource allocation
- Project lifecycle
- Organizational structure
- Project executing, monitoring and controlling
- Project risk management

# Project competency of the project manager



Project document PD (proposal, budget, contract, costed work plan)

## Initiation

Project objectives

Stakeholders

WBS

Budgeting

Log frame indicators

Define deliverables

Funding agreement

## Planning

Project start date

Set project activities

Estimate task duration

Milestone tasks

Project calendar

Task dependencies

Project resource

Resource calendar

Resource assignment

Task constraint

Share work plan

## Execution and monitoring

Baseline plan

Track scope

Track budget

Update work plan

Corrective actions

Performance report

Annual review

Records keeping

## Closure

Verify deliverables

Stakeholder acceptance

Customer acceptance

Evaluation

Lessons learned

Contracts closure

Final report

Handover



## **Status report**

- Current project condition in terms of scope and work plan

## **Progress report**

- Monthly or quarterly file that contains activities completed and milestones reached and next plan

## **Annual report**

- Detailed report that contains project activities, target, indicators, accomplishments,

# Project proposal



- Project summary
- Background
- Goal
- Objectives
- Project description
- Outcome
- Schedule plan
- Budget
- M & E
- Appendix

## Example

Request for proposal (RFP) - Construction of tourism resort in Nugaal valley

# Work breakdown structure (WBS)

1	Main goal of the project
1.1	Objective 1
1.1.1	Activity
1.1.2	Activity
1.2	Objective 2
1.2.1	Activity
1.2.2	Activity
1.2.3	Activity

Task = activity = work package

## Lesson objectives

- State project objectives
- Set project start date
- Create project task and give it a name
- Estimate task duration
- Create milestone task
- Set non-working days
- Define task relationships
- Determine project overall duration

**Project goal:** Pure training center construction project

**Project objectives:**

1. To design and build the main building facilities
2. Equip offices and classes
3. Start enrollment and semesters

Objective1: design and build main building facility

Activity	Outcome
Five classes	Each accommodates 20 students
One meeting hall	Accommodate 150 people
Two offices	Admin and staff
One library	Accommodate 50 books
Three toilets	2 for boys and 1 for girls

Objective2: equip offices and classes

Activity	Outcome
Equip offices	Office has power, chairs, tables, internet, etc.
Equip library	Library has power, internet, books, etc.

Objective3: start enrollment and semesters

Activity	Outcome
Hire administration staff	Admin, HR, finance, security, etc.
Hire lecturers	10 lecturers hired
Student enrollment	Students registered

During project management, the M & E officer is required for setting project targets using available baseline information. He is also required in setting indicators using log frame

Monitoring	Evaluation
Updating work plan	Progress assessment
Daily routine	Annual review
Internal (done by project team)	Done by external consultant or independent consultant

## Exercise

Discuss the difference between outcome, output, and impact

# M & E log frame example

	Project summary	Objectively verifiable indicators (OVI)	Means of verification	Critical assumptions
<b>Goal</b>	Construction of training center	Percentage completion of the construction	Number of classes ready as of now	NA
<b>Outcome</b>	Training center established	Number of students the training center can accommodate	Counting the number of seats in each class	High number of seats in each class will increase number of students
<b>Outputs</b>	1000 Students enrolled for training	Number of students enrolled in first semester	Training center registration file	NA
<b>Activities</b>	Build 5 teaching classes and 2 meeting hall within 3 months	Number of teaching classes and meeting halls constructed	Visit training center for evaluation	Vehicle used for M & E activities purchased

# Scheduling projects from start date

Under *project* tab, select *project information*

It is recommended  
To schedule a project  
From start date

Project Information for 'Pure training center construction project' [Close]

Start date:  Current date:

Finish date:  Status date:

Schedule from:  Calendar:

All tasks begin as soon as possible. Priority:




















Enterprise Custom Fields

Department:

Custom Field Name	Value



# Task and task duration

	 Task Mode ▾	Task Name ▾	Duration ▾	Start ▾	Finish ▾
1		▸ Pure training center construction project	1 day?	Mon 3/15/21	Mon 3/15/21
2		▸ Main building facilities	1 day?	Mon 3/15/21	Mon 3/15/21
3		Five classes			
4		one meeting hall			
5		two offices			
6		one lab			
7		one library			
8		three toilets			
9		▸ Equip offices and class	1 day?	Mon 3/15/21	Mon 3/15/21
10		Equip the two offices			
11		equip the computer lab			
12		equip the library			
13		Setup internet			
14		▸ start first enrollment and semester	1 day?	Mon 3/15/21	Mon 3/15/21
15		hire administration staff			
16		hire lecturers			
17		students enrollment			
18					

Using manual scheduling in the first few Activities

And then automatic scheduling in Subsequent planning

A milestone is a task with **zero** duration that marks an important event within the project.

- It can be reached within the project such as finishing phase 1
- It can be imposed on the project such as deadline for new funding installment request

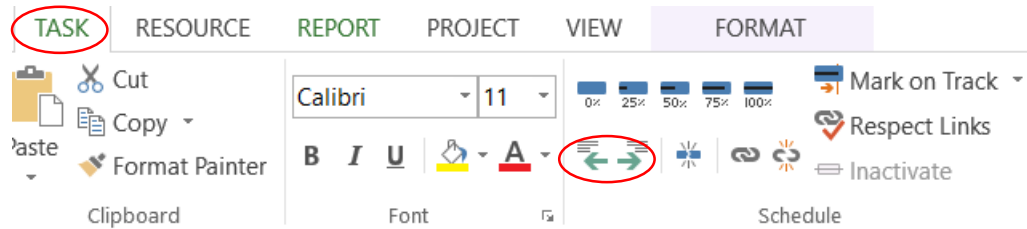
## Task < insert < milestone

construction complete

0 days

# Organize related tasks into phases

Phases group related tasks (for example all tasks related to construction will be in construction phase)



<b>construction phase</b>	<b>10 days</b>	<b>Mon 3/15/21</b>	<b>Fri 3/26/21</b>			
Five classes	10 days					
one meeting hall	5 days					
two offices	3 days					
one lab	2 days					
one library	2 days					
three toilets	3 days					

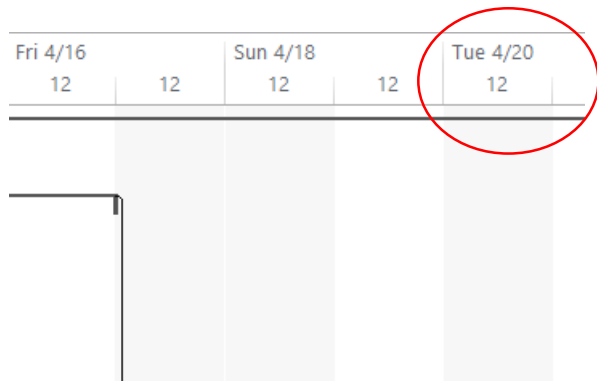


# Setting non-working days for the entire project

Project calendar tells working and non-working time for each task  
For example, working hours per day = 8AM to 4PM,  
Weekend = Friday, lunch break = 1PM – 2PM

## Project < properties < change working time

Let us assume that April 20 is student's day and set that day as non-working day of the project



April 20 is highlighted  
With grey to indicate  
Non-working day

Change Working Time

For calendar: Standard (Project Calendar) Create New Calendar ...

Calendar 'Standard' is a base calendar.

Legend:

- Working
- Nonworking
- 31 Edited working hours
- 31 Exception day
- 31 Nondefault work week

Click on a day to see its working times: April 20, 2021 is nonworking.

April 2021

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

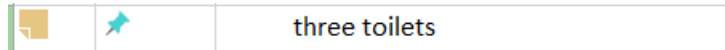
Based on:  
Exception 'Student's day' on calendar 'Standard'.

Exceptions Work Weeks

	Name	Start	Finish
1	Student's day	4/20/2021	4/20/2021

Help Options... OK Cancel

## Task < properties < notes



Task Information [X]

General | Predecessors | Resources | Advanced | Notes | Custom Fields

Name: three toilets      Duration: 3 days       Estimated

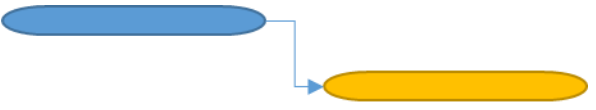
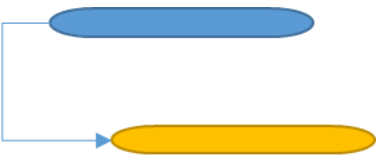
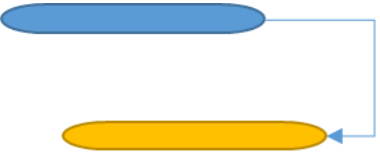
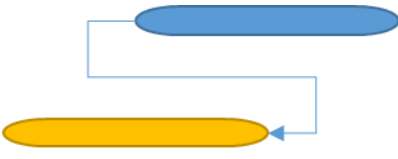
Notes:

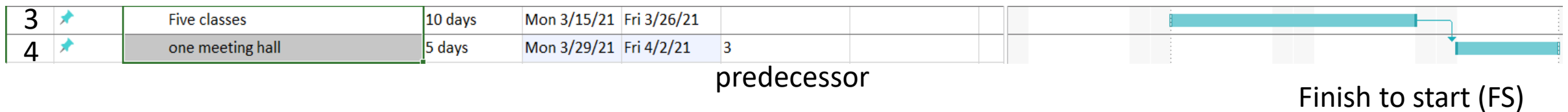
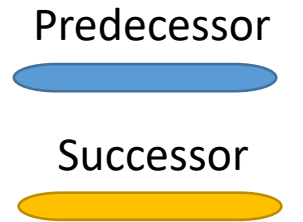
[A] [List] [List] [List] [List] [Image]

Two toilet will be for boys and one for girls

Help      OK      Cancel

# Task dependency

Finish to start (FS)		Successor can not start until its predecessor finishes
Start to start (SS)		Successor and predecessor start at the same time. When one starts, the other one also starts simultaneously
Finish to finish (FF)		Both tasks finish at the same time. For example, project rented office and project finish at the same time
Start to finish (SF)		Successor task cannot finish until its predecessor task starts



# Start to start (SS) dependency

## Task tab < information

Task Mode	Task Name	Duration	Start	Finish
	▸ Pure training center construction project	25 days?	Mon 3/15/21	Fri 4/16/21
	▸ construction phase	25 days	Mon 3/15/21	Fri 4/16/21
★	Five classes	10 days	Mon 3/15/21	Fri 3/26/21
★	one meeting hall	5 days	Mon 3/29/21	Fri 4/2/21
★	two offices	3 days	Mon 4/5/21	Wed 4/7/21
★	one lab <b>Predecessor</b>	2 days	Thu 4/8/21	Fri 4/9/21
★	one library <b>Successor</b>	2 days	Mon 4/12/21	Tue 4/13/21
★	three toilets	3 days	Wed 4/14/21	Fri 4/16/21
	▸ building equipping phase	8 days	Mon 3/15/21	Wed 3/24/21
★?	Equip the two offices	5 days		
★?	equip the computer lab	5 days		
★?	equip the library	8 days		
★?	Setup internet	1 day		
★?	construction complete	0 days		
	▸ semester starting phase	4 days?	Mon 3/15/21	Thu 3/18/21
★?	hire administration staff	4 days		

Task Information

General | **Predecessors** | Resources | Advanced | Notes | Custom Fields

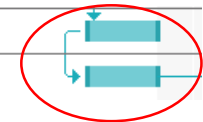
Name:  Duration:   Estimated

Predecessors:

ID	Task Name	Type	Lag
6	one lab	Start-to-Start (SS)	0d

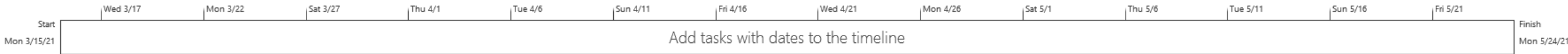
Help OK Cancel

★	one lab	2 days	Thu 4/8/21	Fri 4/9/21	5
★	one library	2 days	Thu 4/8/21	Fri 4/9/21	6SS



Can run parallel

The **timeline** bar can be used to determine project start date and end date



We can also check project duration from project information dialog box

Project Information for 'Pure training center construction project'

Start date: Mon 3/15/21 | Current date: Tue 3/2/21

Finish date: Mon 5/24/21 | Status date: NA

Schedule from: Project Start Date | Calendar: Standard

All tasks begin as soon as possible. Priority: 500

Enterprise Custom Fields

Department: [Dropdown]

Custom Field Name	Value
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Buttons: Help, **Statistics...**, OK, Cancel

Project Statistics for 'Pure training center construction project.mpp'

	Start	Finish
Current	Mon 3/15/21	Mon 5/24/21
Baseline	NA	NA
Actual	NA	NA
Variance	0d	0d

	Duration	Work	Cost
Current	51d?	0h	\$0.00
Baseline	0d	0h	\$0.00
Actual	0d	0h	\$0.00
Remaining	51d?	0h	\$0.00

Percent complete:  
Duration: 0% | Work: 0%

Close



## Lesson objectives

- Work, cost, and material resource
- Associate people and equipment with a task (work resource)
- Resource capacity and pay rate
- Set resource calendar to control non-working days of an individual resource
- Associate financial cost with a task (cost resources)
- Document resource notes
- Add or remove resources for automatically scheduled tasks

**Availability** of resource to  
Work on task

**Cost** required to pay for  
Those resources

People	Staff, contracting firm, consultant, etc.
Equipment	Vehicle, computer, printer, etc.

Amount of time that a resource is available for work on task  
100% means full capacity of a single resource in the work calendar

### View < resource views < resource sheet

Resource Name	Type	Material	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use
Engineer	Work		E		100%	\$15.00/day	\$0.00/hr	\$0.00
Construction firm	Work		C		50%	\$50.00/day	\$0.00/hr	\$0.00
Vehicle	Work		V		100%	\$0.00/hr	\$0.00/hr	\$80.00

Cost per use. For vehicle \$80 per trip

A resource is assigned to a task

Cost of assignment = work time x pay rate

In this exercise, we set March 22 and 23 as non-working days for the resource Engineer. He will be attending training

**Project < change working time**

Go to exception tab and set off-days

Change Working Time

For calendar: Engineer

Base calendar: Standard

Legend:

- Working
- Nonworking
- 31 Edited working hours
- 31 Exception day
- 31 Nondefault work week

Click on a day to see its working times: March 22, 2021 is nonworking.

March 2021

S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Based on:  
Exception 'Will attend train...' on calendar 'Engineer'.

Exceptions Work Weeks

	Name	Start	Finish
1	Will attend training in Nairobi	3/22/2021	3/23/2021

Details...  
Delete

# Resource calendar for work resources

In this exercise, we set 6 days by 8 hours for the construction firm resource except Friday  
For multiple resources, create new project calendar instead of resource by resource change

## Project < change working time

In the for calendar, select construction firm resource  
Click work weeks, and set working days except Friday

Change Working Time

For calendar: Construction firm

Base calendar: Standard

Legend:

- Working
- Nonworking
- 31 Edited working hours
- 31 Exception day
- 31 Nondefault work week

On this calendar:

Click on a day to see its working time

March 2021

S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Details for '[Default]'

Set working time for this work week

Select day(s):

- Sunday
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday

Use times from base calendar for these days.

Set days to nonworking time.

Set day(s) to these specific working times:

	From	To
1	7:00 AM	12:00 PM
2	1:00 PM	5:00 PM

Help OK Cancel

	Name	Start	Finish
1	[Default]	NA	NA

Details... Delete

# Cost resource for project budgeting

Cost resources does not effect task scheduling. They represent financial expenses on tasks

## View < resource sheet

Add buying a land row and set resource type as cost

Resource Name	Type	Material	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base
Engineer	Work		E		100%	\$15.00/day	\$0.00/hr	\$0.00	Prorated	Standard
Construction firm	Work		C		50%	\$50.00/day	\$0.00/hr	\$0.00	Prorated	Standard
Vehicle	Work		V		100%	\$0.00/hr	\$0.00/hr	\$80.00	Prorated	Standard
Buying a aland	Cost		B						Prorated	

# Resource details

The screenshot shows a software interface with a ribbon menu and a dialog box. The ribbon menu includes tabs for TASK, RESOURCE, REPORT, PROJECT, VIEW, and FORMAT. The VIEW tab is active, and the 'Notes' icon is circled in red. The dialog box, titled 'Resource Information', has tabs for General, Costs, Notes, and Custom Fields. The 'Notes' tab is selected, showing a text area with the following content:

Resource Name: Construction firm

Notes:

Pure construction firm has implemented several successful project on construction. It will design and construction the training facility

Buttons at the bottom of the dialog include Help, Details..., OK, and Cancel.

Resource Name	Type
Engineer	Work
Construction firm	Work
Vehicle	Work
Buying a aland	Cost

# Assign work resource to a task

TASK RESOURCE REPORT PROJECT VIEW **FORMAT**

Assign Resources Pool Add Resources Insert Information Notes Details Level Selection Resource Level All Leveling Options Clear Leveling Next Overalllocation

Assignments Insert Properties Level

Task has a work when a resource is assigned to it

Work = duration x assignment

Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Add
	<b>Pure training center construction project</b>	<b>50 days?</b>	<b>Mon 3/15/21</b>	<b>Mon 5/24/21</b>			
	<b>construction phase</b>	<b>25 days</b>	<b>Mon 3/15/21</b>	<b>Fri 4/16/21</b>			
	Five classes	10 days	Mon 3/15/21	Fri 3/26/21		Foreman1	
	one meeting hall	5 days	Mon 3/29/21	Fri 4/2/21			
	two offices	3 days	Mon 4/5/21	Wed 4/7/21			
	one lab	2 days	Thu 4/8/21	Fri 4/9/21			
	one library	2 days	Thu 4/8/21	Fri 4/9/21			
	three toilets	3 days	Wed 4/14/21	Fri 4/16/21			
	<b>building equiping phase</b>	<b>19 days</b>	<b>Sat 4/17/21</b>	<b>Mon 5/17/21</b>			
	Equip the two offices	5 days	Sat 4/17/21	Fri 4/23/21			
	equip the computer lab	5 days	Mon 4/26/21	Fri 4/30/21			
	equip the library	8 days	Mon 5/3/21	Wed 5/12/21			
	Setup internet	2 days	Thu 5/13/21	Fri 5/14/21			
	construction complete	0 days	Mon 5/17/21	Mon 5/17/21			
	<b>semester starting phase</b>	<b>7 days?</b>	<b>Fri 5/14/21</b>	<b>Mon 5/24/21</b>			
	hire administration staff	4 days	Fri 5/14/21	Wed 5/19/21			
	hire lecturers	2 days	Thu 5/20/21	Fri 5/21/21			
	students enrollment	3 days	Thu 5/20/21	Mon 5/24/21			

Assign Resources

Task: Five classes

+ Resource list options

Resources from Pure training center construction project.mpp

Resource Name	R/D	Units	Cost
<input checked="" type="checkbox"/> Foreman1		100%	\$50.00
Buying a aland			10 days x \$5
Construction firm			
Engineer			
foreman2			
foreman3			
foreman4			
Vehicle			

Hold down Ctrl and click to select multiple resources

# Read resource assignment detail from task form

Task < split view < details

The screenshot shows the Microsoft Project interface. The ribbon includes FILE, TASK, RESOURCE, REPORT, PROJECT, VIEW, and FORMAT. The 'VIEW' tab is active, showing 'Task Views' (Gantt Chart, Task Usage, Other Views), 'Resource Views' (Team Planner, Other Views), and 'Data' (Sort, Outline, Tables, Filter, Group by). The 'Split View' section is circled in red, showing 'Timeline' (unchecked) and 'Details' (checked) with a dropdown menu set to 'Task Form'.

The Gantt Chart shows a task list with the following data:

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1	Pure training center construction project	50 days?	Mon 3/15/21	Mon 5/24/21		
2	construction phase	25 days	Mon 3/15/21	Fri 4/16/21		
3	Five classes	10 days	Mon 3/15/21	Fri 3/26/21		Foreman1,Engineer
4	one meeting hall	5 days	Mon 3/29/21	Fri 4/2/21	3	Engineer,Foreman.
5	two offices	3 days	Mon 4/5/21	Wed 4/7/21	4	
6	one lab	2 days	Thu 4/8/21	Fri 4/9/21	5	
7	one library	2 days	Thu 4/8/21	Fri 4/9/21	6SS	
8	three toilets	3 days	Wed 4/14/21	Fri 4/16/21	7	
9	building equiping phase	19 days	Sat 4/17/21	Mon 5/17/21	2	
10	Equip the two offices	5 days	Sat 4/17/21	Fri 4/23/21		
11	equip the computer lab	5 days	Mon 4/26/21	Fri 4/30/21	10	
12	equip the library	8 days	Mon 5/3/21	Wed 5/12/21	11	

The 'TASK FORM' for task 4 shows the following details:

- Name: one meeting hall
- Duration: 5 days
- Start: Mon 3/29/21
- Finish: Fri 4/2/21
- Task type: Fixed Units
- % Complete: 0%

The resource assignment table is as follows:

ID	Resource Name	Units	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
1	Engineer	100%	40h	0h	0h	0h	40h
5	Foreman1	100%	40h	0h	0h	0h	40h
6	foreman2	100%	40h	0h	0h	0h	40h
7	foreman3	100%	40h	0h	0h	0h	40h
2	Construction firm	50%	20h	0h	0h	0h	20h

For task 4, these Resources are needed.

The work needed per Resource to complete This task shown



# Add or remove resource assignment

You added resources to this task. Do you want to:

- Reduce duration but keep the same amount of work.
- Increase the amount of work but keep the same duration.
- Reduce the hours resources work per day (units), but keep the same duration and work.

Add more resource assignment, and reduce duration

Add more resource assignment, but keep duration

You removed resources from this task. Do you want to:

- Increase duration but keep the same amount of work.
- Decrease the amount of work but keep the same duration.
- Increase the hours resources work per day (units), but keep the same duration and work.

Remove resource assignment, because  
Remaining resources are already enough

Remove resource assignment, and increase  
Work hours of the removed resource  
for remaining resources

# Assign cost resource to a task

three toilets	3 days	Wed 4/14/21	Fri 4/10/21	1	
<b>building equipping phase</b>	<b>19 days</b>	<b>Sat 4/17/21</b>	<b>Mon 5/17/21</b>	<b>2</b>	
Equip the two offices	5 days	Sat 4/17/21	Fri 4/23/21		
equip the computer lab	5 days	Mon 4/26/21	Fri 4/30/21	10	
equip the library	8 days	Mon 5/3/21	Wed 5/12/21	11	
Setup internet	2 days	Thu 5/13/21	Fri 5/14/21	12	internet[\$80.00]
construction complete	0 days	Mon 5/17/21	Mon 5/17/21	13	
<b>semester starting phase</b>	<b>7 days?</b>	<b>Fri 5/14/21</b>	<b>Mon 5/24/21</b>	<b>9</b>	
hire administration staff	4 days	Fri 5/14/21	Wed 5/19/21		
hire lecturers	2 days	Thu 5/20/21	Fri 5/21/21	16	
students enrollment	3 days	Thu 5/20/21	Mon 5/24/21	17SS	

Assign Resources ✕

Task: Setup internet

+ Resource list options

Resources from Pure training center construction project.mpp

	Resource Name	R/D	Units	Cost
<input checked="" type="checkbox"/>	internet			\$80.00
<input type="checkbox"/>	accountant			
<input type="checkbox"/>	Buying a aland			
<input type="checkbox"/>	Construction firm			
<input type="checkbox"/>	Engineer			
<input type="checkbox"/>	Foreman1			
<input type="checkbox"/>	foreman2			
<input type="checkbox"/>	foreman3			
<input type="checkbox"/>	foreman4			
<input type="checkbox"/>	Vehicle			

Hold down Ctrl and click to select multiple resources

Assign

Remove

Replace...

Graph

Close

Help

## Lesson objectives

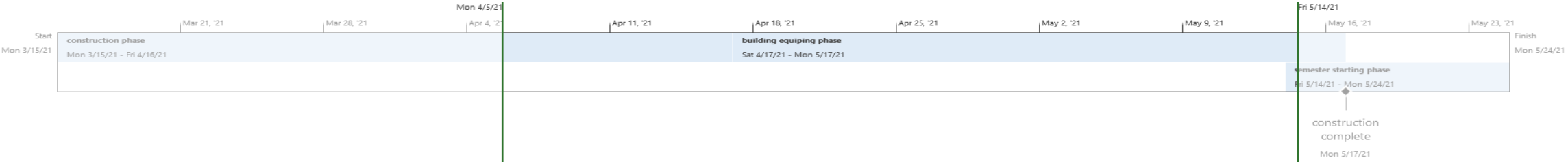
- Format the Gantt chart
- Format specific task to make it stand out
- Add main tasks and milestones to the timeline view
- Draw objects on the Gantt chart

# Customize the timeline view

The screenshot shows the 'FORMAT' menu with options like 'Overlapped Tasks', 'Pan & Zoom', and 'Existing Tasks' (circled in red). Below it is the 'Add Tasks to Timeline' dialog box with a tree view of tasks. The tree view includes 'Pure training center construction project' (expanded) with sub-items: 'construction phase' (checked), 'Five classes', 'one meeting hall', 'two offices', 'one lab', 'one library', 'three toilets', and 'building equipping phase' (checked). Under 'building equipping phase' are 'Equip the two offices', 'equip the computer lab', and 'equip the library'.

Task Mode	Task Name	Duration
▶	Pure training center construction project	50 days
▶	construction phase	25 days
▶	Five classes	10 days
▶	one meeting hall	5 days
▶	two offices	3 days
▶	one lab	2 days
▶	one library	2 days
▶	three toilets	3 days
▶	building equipping phase	19 days

TIMELINE

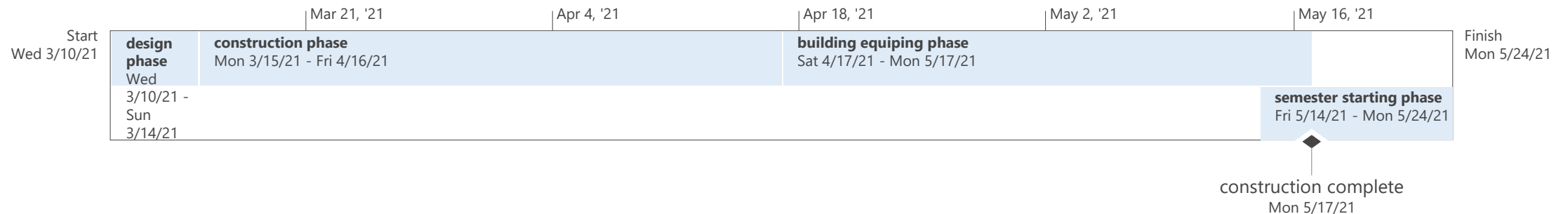


# Copying Gantt chart and timeline

Scroll to the task you want to copy and select, then go to **task < copy < copy picture**, then paste to word or presentation

ID	Task Mode	Task Name	Duration	Start	Finish	Mar 21, '21	Apr 4, '21	Apr 18, '21	May 2, '21	May 16, '21	May 30, '21	Jun 13, '21	Jun 27, '21
						F T S W	S T M	F T S W	S T M	F T S W	S T M	F T S W	S T M
11	★	Equip the two offices	5 days	Sat 4/17/21	Fri 4/23/21								
12	★	equip the computer lab	5 days	Mon 4/26/21	Fri 4/30/21								
13	★	equip the library	8 days	Mon 5/3/21	Wed 5/12/21								
14	★	Setup internet	2 days	Thu 5/13/21	Fri 5/14/21								
15	★	construction complete	0 days	Mon 5/17/21	Mon 5/17/21								

Select the timeline, then go to **format < copy timeline < full size**

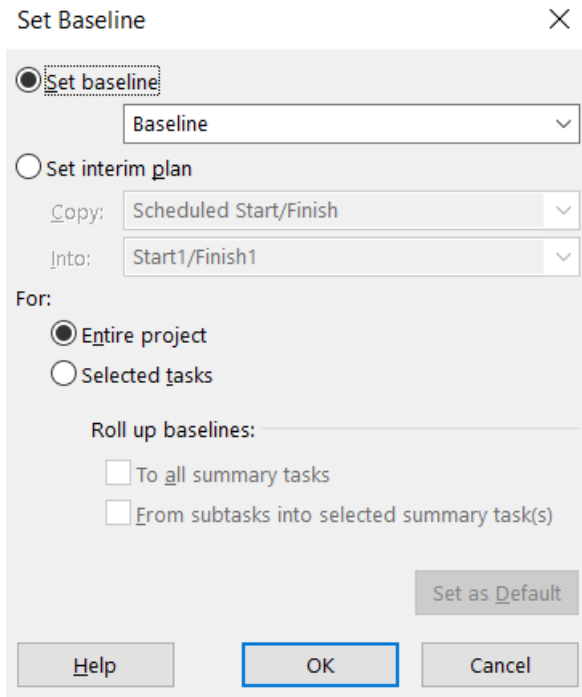


## Lesson objectives

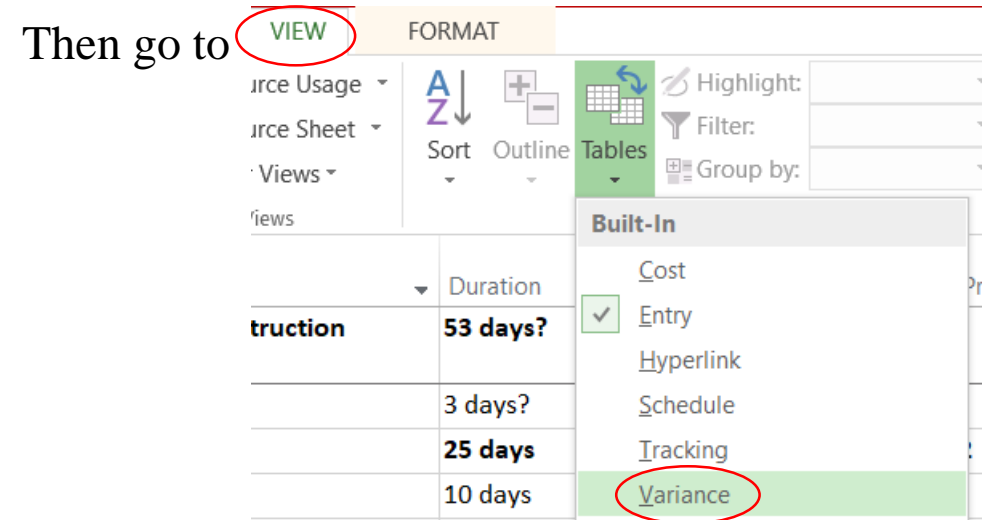
- Project baseline plan
- Project update as it progresses
- Actual task schedule

# Project baseline plan

## Project < schedule < set baseline



Open the task sheet from  
**View < tables < variance**



To view the baseline



Scheduled plan    Baseline plan

Task	Task Name	Start	Finish	Baseline Start	Baseline Finish	Start Var.	Finish Var.
→	<b>Pure training center c</b>	<b>Wed 3/10/21</b>	<b>Mon 5/24/21</b>	<b>Wed 3/10/21</b>	<b>Mon 5/24/21</b>	<b>0 days</b>	<b>0 days</b>
→	design phase	Wed 3/10/21	Sun 3/14/21	Wed 3/10/21	Sun 3/14/21	0 days	0 days
→	<b>construction phase</b>	<b>Mon 3/15/21</b>	<b>Fri 4/16/21</b>	<b>Mon 3/15/21</b>	<b>Fri 4/16/21</b>	<b>0 days</b>	<b>0 days</b>
→	Five classes	Mon 3/15/21	Fri 3/26/21	Mon 3/15/21	Fri 3/26/21	0 days	0 days
→	one meeting hall	Mon 3/29/21	Fri 4/2/21	Mon 3/29/21	Fri 4/2/21	0 days	0 days
→	two offices	Mon 4/5/21	Wed 4/7/21	Mon 4/5/21	Wed 4/7/21	0 days	0 days

## Project < status < update project

Update Project ✕

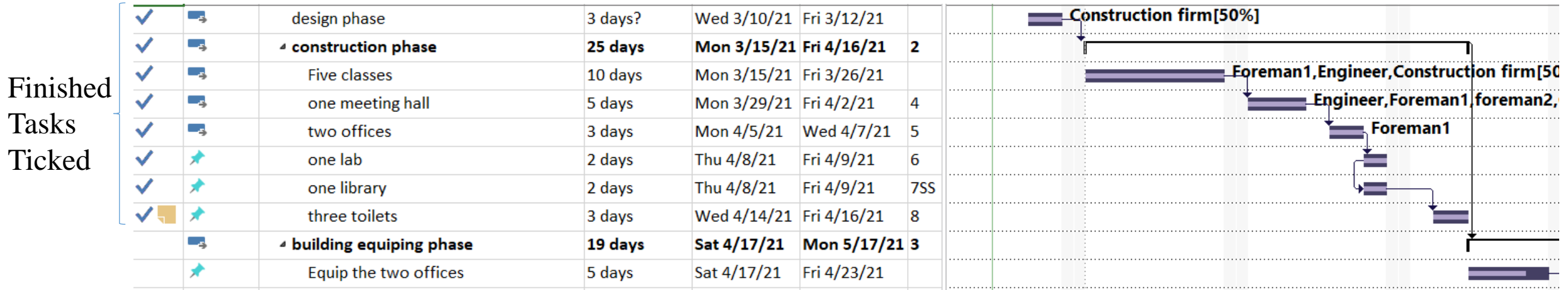
Update work as complete through: Wed 4/21/21

Set 0% - 100% complete  
 Set 0% or 100% complete only

Reschedule uncompleted work to start after: Sun 3/7/21

For:  Entire project  Selected tasks

Show completion percentage of all tasks scheduled to start before 4/21/2021



Progress indicated on the Gantt chart



# Record actual work on task schedule

View < tables < work

On task 4, currently it is 0% completion

Task Name	Work	Baseline	Variance	Actual	Remaining	% W. Comp.	Gantt Chart													
4 Five classes	264 hrs	264 hrs	0 hrs	0 hrs	264 hrs	0%	[Gantt bar for task 4: Mar 14 - Mar 28, 2021. Resources: Foreman1, Engineer, Construction firm[50%], foreman4]													
5 one meeting hall	140 hrs	140 hrs	0 hrs	140 hrs	0 hrs	100%	[Gantt bar for task 5: Mar 28 - Apr 4, 2021. Resources: Engineer, Foreman1, foreman2, Construction firm[50%]]													
6 two offices	24 hrs	24 hrs	0 hrs	24 hrs	0 hrs	100%	[Gantt bar for task 6: Apr 4 - Apr 11, 2021. Resource: Foreman1]													
7 one lab	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs	100%	[Gantt bar for task 7: Apr 11 - Apr 18, 2021]													
8 one library	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs	100%	[Gantt bar for task 8: Apr 18 - Apr 25, 2021]													
9 three toilets	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs	100%	[Gantt bar for task 9: Apr 25 - May 2, 2021]													

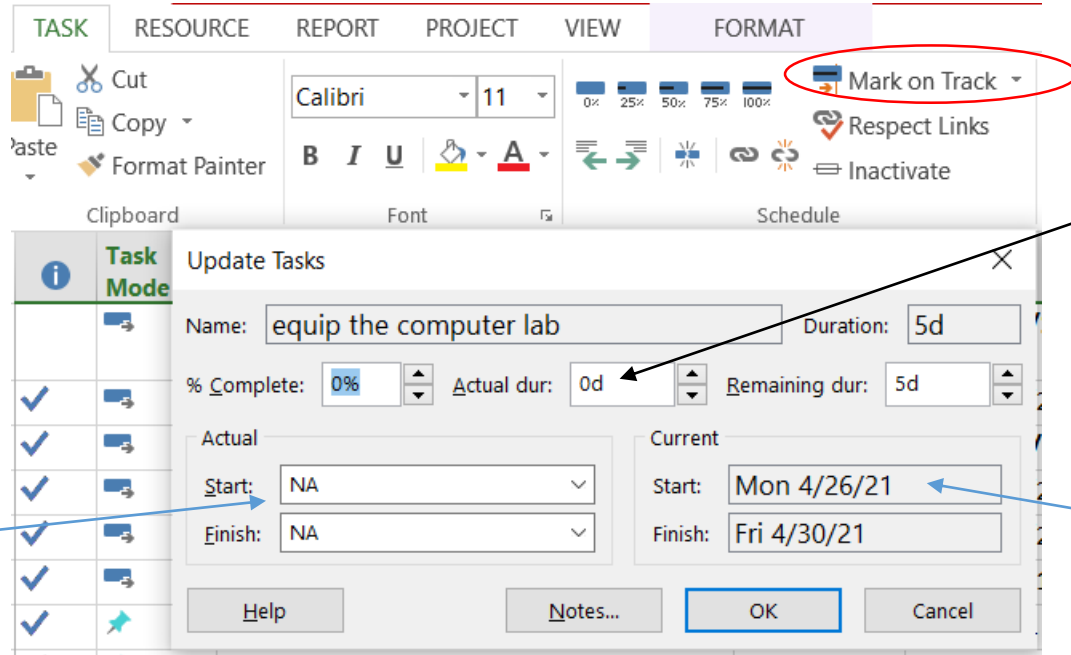
But after completion 300hrs work is spent

Task Name	Work	Baseline	Variance	Actual	Remaining	% W. Comp.	Gantt Chart													
4 Five classes	300 hrs	264 hrs	36 hrs	300 hrs	0 hrs	100%	[Gantt bar for task 4: Mar 14 - Mar 28, 2021. Resources: Foreman1, Engineer, Construction firm[50%], foreman4]													
5 one meeting hall	140 hrs	140 hrs	0 hrs	140 hrs	0 hrs	100%	[Gantt bar for task 5: Mar 28 - Apr 4, 2021. Resources: Engineer, Foreman1, foreman2, Construction firm[50%]]													
6 two offices	24 hrs	24 hrs	0 hrs	24 hrs	0 hrs	100%	[Gantt bar for task 6: Apr 4 - Apr 11, 2021. Resource: Foreman1]													
7 one lab	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs	100%	[Gantt bar for task 7: Apr 11 - Apr 18, 2021]													
8 one library	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs	100%	[Gantt bar for task 8: Apr 18 - Apr 25, 2021]													
9 three toilets	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs	100%	[Gantt bar for task 9: Apr 25 - May 2, 2021]													

Scheduled = 264hrs

Actual = 300hrs

# Record actual start date on task schedule



Instead of changing the start date, the duration can be extended which will effect finish date

Set actual start date

Planned start date

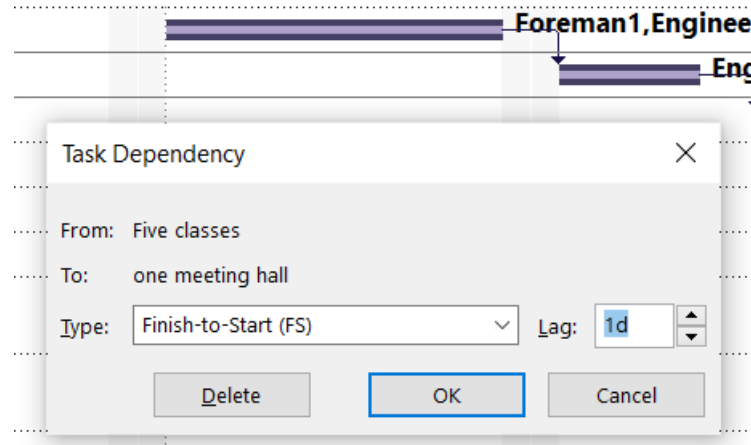
## Lesson objectives

- Lag and lead time
- Task constraint
- Task split due to interruption
- Specific task calendar
- Set deadline on task
- Task budget using fixed cost
- Repetitive tasks (monthly meetings, monthly reports, etc.)
- Project critical path

# Entering lead and lag times

Double click on the Gantt chart link between tasks to open task dependency dialog box

- Lag time delays the start of the successor and entered as positive
- Lead time causes the successor to start before predecessor finishes and entered as negative



Task constraint controls start date, finish date, and rescheduling flexibility

## Hard constraint

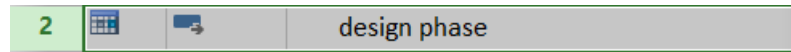
- Task must *start or end* on specified date
- Example are project handover date, project funding application date, etc.

## As soon as possible constraint

- Task can start as soon as possible with flexibility in rescheduling

## Moderate constraint

- *Start no earlier than* (e.g. will start on or after 15 March)
- *Start no later than* (e.g. will start on or before 15 March)
- *Finish no earlier than* (e.g. will finish after 15 March)
- *Finish no later than* (e.g. will finish on or before 15 March)



This task has *finish no earlier than* Constraint on 14 March and will finish After this date

Task Information

General | Predecessors | Resources | **Advanced** | Notes | Custom Fields

Name: design phase Duration: 3 days?  Estimated

Constrain task

Deadline: NA

Constraint type: **Finish No Earlier Than** Constraint date: **Sun 3/14/21**

Task type: Fixed Units  Effort driven

Calendar: None  Scheduling ignores resource calendars

WBS code: 1.1

Earned value method: % Complete

Mark task as milestone

Help OK Cancel

# Task split due to interruption

Project task could be interrupted due to

- Expected circumstances (e.g. resource unavailable due to meeting or coming late due to traffic jam)
- Unexpected circumstances (e.g. shared resource assigned to another high priority task, equipment malfunction)

The screenshot shows the Microsoft Project interface. The ribbon is set to 'FORMAT'. The 'Schedule' group contains an 'Interrupt' icon (a star with a lightning bolt) circled in red. Below the ribbon is a task table with the following data:

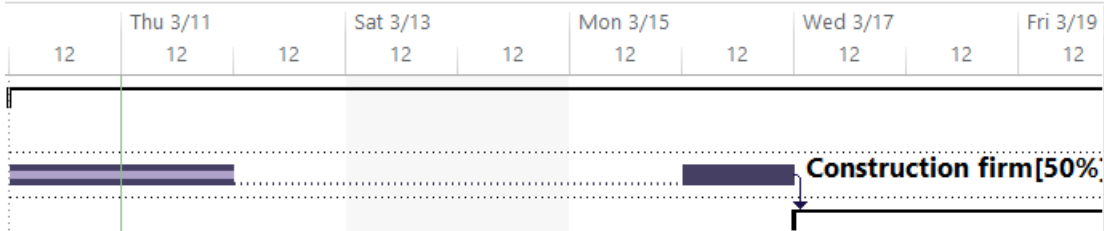
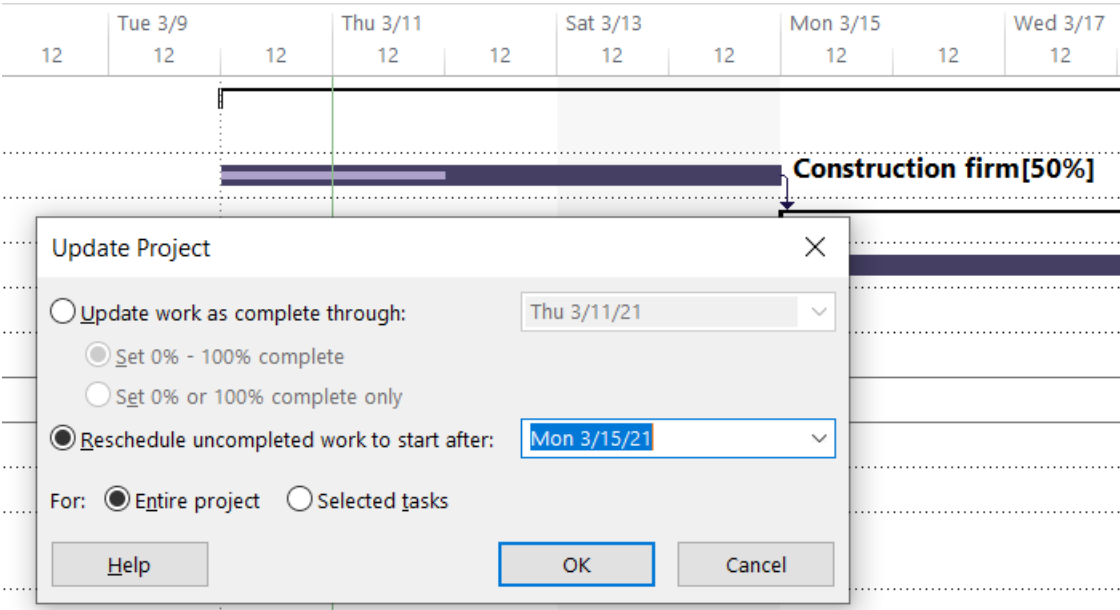
WB	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	% Complete
1.3.2		equip the computer lab	5 days	Tue 4/27/21	Tue 5/4/21	11		0%

To the right of the table is a Gantt chart showing a task bar for 'equip the computer lab' from Tuesday 4/27/21 to Tuesday 5/4/21. The bar is solid dark blue until the end of the task, where it transitions into a dotted line segment. A blue arrow points from the text below to this dotted line segment.

Dotted lines represent  
Interruption time in which there  
Is no work and duration not counted

# Reschedule incomplete task

This task has 3 days duration and starts on Wednesday  
Instead of finishing on Friday, we want to re-start it on Monday



# Specific task calendar

Some tasks might be performed during weekends or night shifts, which differs from project calendar (8hrs by 5 days)

**1** Change Working Time

For calendar: Standard (Project Calendar) Create New Calendar ...

Calendar 'Standard' is a base calendar.

Legend:

- Working
- Nonworking
- 31 Edited working hours
- On this calendar:
- 31 Exception day
- 31 Nondefault work week

Click on a day to see its working times: Working times for March 8, 2021:

S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

**Create New Base Calendar**

Name: Recruitment only on Tuesday

Create new base calendar

Make a copy of Standard calendar

**3** Task Information

General | Predecessors | Resources | Advanced | Notes | Custom Fields

Name: hire lecturers Duration: 2 days  Estimated

Constrain task

Deadline: NA

Constraint type: As Soon As Possible Constraint date: NA

Task type: Fixed Units  Effort driven

**Calendar:** Recruitment only on Tuesday  Scheduling ignores resource calendars

Change Working Time

For calendar: Recruitment only on Tuesday **2**

Calendar 'Recruitment only ...' is a base

Legend:

- Working
- Nonworking
- 31 Edited working hours
- On this calendar:
- 31 Exception day
- 31 Nondefault work week

Click on a day

Select day(s):

- Use Project default times for these days.
- Set days to nonworking time.
- Set day(s) to these specific working times:

From	To
8:00 AM	12:00 PM
1:00 PM	5:00 PM

Exceptions **Work Weeks**

Name	Start	Finish
1 [Default]	NA	NA

Details...

Task Name	Work	Details	T	W	T	F	S	S	M	T
hire lecturers	16 hrs	Work	8h							8h
project assistance	16 hrs	Work	8h							8h



# Set deadline on task

Deadline is used when a task is used as soon as possible and given sometime after finish date

Task Information

General | Predecessors | Resources | Advanced | Notes | Custom Fields

Name: construction complete Duration: 0 days  Estimated

Constrain task

Deadline: NA

Constraint type: As Soon As Possible

Task type: Fixed Units

Calendar: None

WBS code: 1.3.5

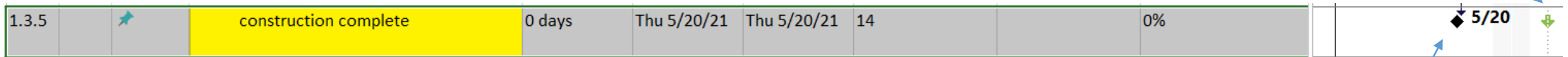
Earned value method: % Complete

Mark task as milestone

Some of the fields above are not editable because the task is Manually Scheduled.

Today

OK Cancel



Milestone scheduled on 20 May

# Task budget using fixed cost

A fixed cost is a specific amount of money budgeted for a particular task, that does not change with resource assignment

- For example a task of hiring an accountant for the project, which is paid as project starts

## Open task sheet

### View < tables < cost

Task Name	Fixed	Fixed Cost	Total	Baseline	Variance	Actual	Remaining
staff salary	\$400.00	Start	\$400.00	\$0.00	\$400.00	\$0.00	\$400.00

# Repetitive task

Repetitive tasks include yearly M&E, progress reports, meetings that take resources away from project tasks

The screenshot shows the Microsoft Project interface with the 'FORMAT' ribbon selected. The 'Task' dropdown menu is open, showing options like 'Task', 'Recurring Task...', 'Blank Row', and 'Import Outlook Tasks...'. A tooltip for 'Insert Recurring Task' is displayed, explaining that it is used for tasks that occur regularly. The task list below shows a task named 'M & E' with a duration of 1 day, starting and finishing on Tue 4/27/21.

WBS	Task Mode	Task Name	Duration	Start	Finish
1.3.5		M & E	1 day	Tue 4/27/21	Tue 4/27/21
1.3.5.1		M & E 1	1 day	Tue 4/27/21	Tue 4/27/21
1.3.5.2		M & E 2	1 day	Tue 4/27/21	Tue 4/27/21

Recurring Task Information

Task Name: M & E      Duration: 1d

Recurrence pattern

Daily     Day 27 of every 1 month(s)

Weekly

Monthly     The Third Monday of every 1 months

Yearly

Range of recurrence

Start: Mon 3/15/21     End after: 2 occurrences

End by: Mon 5/24/21

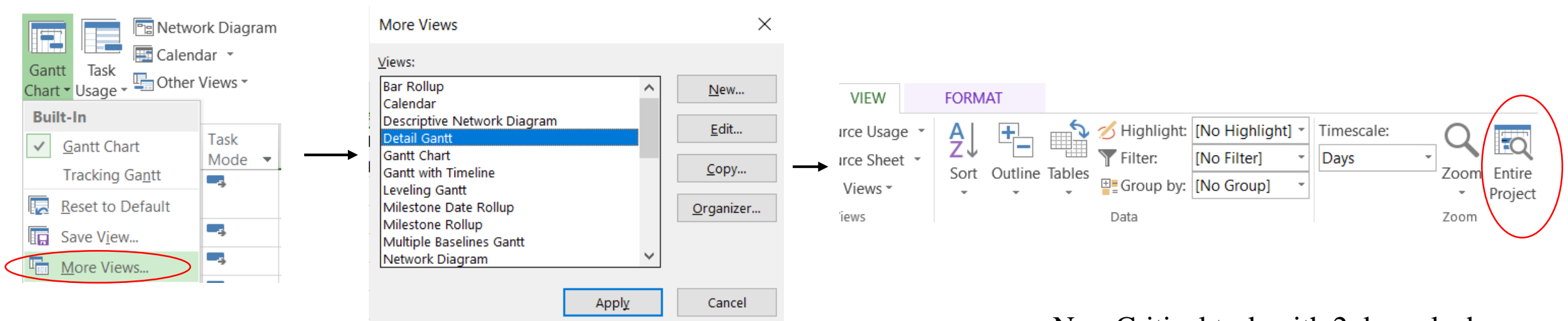
Calendar for scheduling this task

Calendar: None     Scheduling ignores resource calendars

Buttons: Help, OK, Cancel

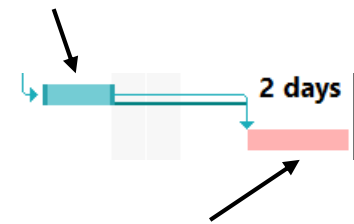
Next assign resources to this recurring task

- *Critical path* is a series of tasks that will extend project duration if they are delayed
- A task is on critical path if *total slack* = 0 days
- *Total slack* is the time a task can be delayed without affecting project total duration
- *Free slack* is the amount of time a task can be delayed without delaying another task



one library	0 edays	2 days	Thu 4/8/21	Fri 4/9/21	9
three toilets	0 edays	3 days	Wed 4/14/21	Fri 4/16/21	

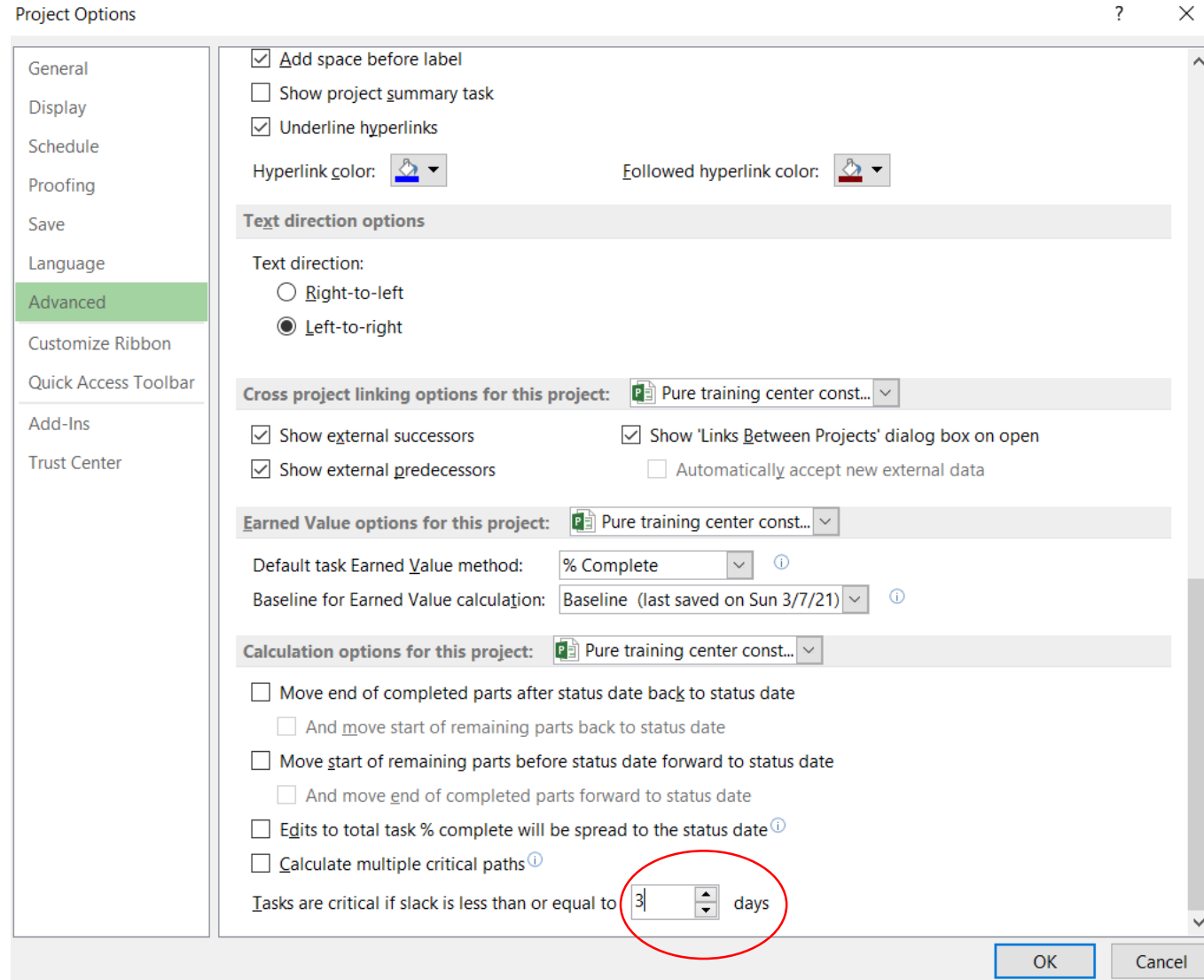
Non-Critical task with 2 days slack



It is good management practice to reduce project total duration

Critical task with zero slack

# Change critical path slack from default 0 days



## Lesson objectives

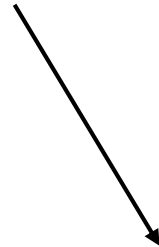
- Resource capacity based on availability
- Different pay rates for work resource
- Material resource

# Different resource capacity based on their availability

Resource Name	Type	Material	Initials	Group	Max. Units
Vehicle	Work		V		100%

- This resource is available 100% for the tasks it is assigned to
- If two vehicles are available capacity will be 200%

But sometimes we want to adjust resource capacity during different times, for example one vehicle maybe available from start up to 20 April and two vehicles from 21 April until finish date



Resource Information

General | Costs | Notes | Custom Fields

Resource name: Vehicle Initials: V

Email: Group:

Logon Account... Code:

Booking type: Committed Type: Work

Material label:

Default Assignment Owner:  Generic  Budget

Inactive

Change Working Time ...

Resource Availability

Available From	Available To	Units
NA	4/20/2021	100%
4/21/2021	NA	200%

# Different pay rates for a resource depending on task

Resource A can be assigned to task X with \$10 per day

Resource A can also be assigned to task Y with \$15 per day



Resource A has different pay rates

Resource Information

General Costs Notes Custom Fields

Resource Name: driver

Cost rate tables

For rates, enter a value or a percentage increase or decrease from the previous rate. For instance, if a resource's Per Use Cost is reduced by 20%, type -20%.

A (Default) B C D E

	Effective Date	Standard Rate	Overtime Rate	Per Use Cost
	--	\$15.00/d	\$0.00/h	\$0.00

Resource Information

General Costs Notes Custom Fields

Resource Name: driver

Cost rate tables

For rates, enter a value or a percentage increase or decrease from the previous rate. For instance, if a resource's Per Use Cost is reduced by 20%, type -20%.

A (Default) B C D E

	Effective Date	Standard Rate	Overtime Rate	Per Use Cost
	--	\$10.00/d	\$0.00/h	\$0.00



Assignment Information

General Tracking Notes

Task: Equip the two offices

Resource: driver

Work: 5d Units: 100%

Work contour: Flat

Start: Sat 4/17/21 Booking type: Committed

Finish: Fri 4/23/21 Cost: \$50.00

Cost rate table: B

Assignment Owner:

Some because the task is Manually Scheduled.

Select resource pay rate



# Different pay rates for a resource depending on time

Resource A has pay rate of \$10 per day in first year

Resource A has pay rate of \$15 per day in second year



- Resource A has different pay rates
- Project will calculate resource cost based on scheduling of the work resource

Resource Information ×

General **Costs** Notes Custom Fields

Resource Name: driver

Cost rate tables

For rates, enter a value or a percentage increase or decrease from the previous rate. For instance, if a resource's Per Use Cost is reduced by 20%, type -20%.

A (Default)	B	C	D	E
	Effective Date	Standard Rate	Overtime Rate	Per Use Cost
	--	\$15.00/d	\$0.00/h	\$0.00
	Tue 4/20/21	\$18.00/d	\$0.00/h	\$0.00

Initial pay rate is \$15 per day  
 But starting from 20 April, pay rate will increase 20% → 20% of \$15 = \$18 (new pay rate)

visit project site	3 days	Mon 4/12/21	Wed 4/14/21	8	driver
--------------------	--------	-------------	-------------	---	--------

3 days before 20 April → cost = 3 x 15 = \$45

meeting travel to remote resort	2 days	Tue 6/1/21	Tue 6/8/21	20	driver
---------------------------------	--------	------------	------------	----	--------

2 days after 20 April → cost = 2 x 18 = \$36

Assign Resources ×

Task: visit project site

+ Resource list options

Resources from Pure training center construction project.mpp

Resource Name	R/D	Units	Cost
✓ driver		100%	\$45.00

Assign

Assign Resources ×

Task: meeting travel to remote resort

+ Resource list options

Resources from Pure training center construction project.mpp

Resource Name	R/D	Units	Cost
✓ driver		100%	\$36.00

Assign

# Material resource

Material resources end as project consumes them. Examples are water and fuel

Resource Name	Type	Material	Initials	Group	Max. Units	Std. Rate
fuel	Material	Liter	f			\$30.00

\$30 per liter of fuel

Assign Resources ×

Task: site visit

+ Resource list options

Resources from Pure training center construction project.mpp

	Resource Name	R/D	Units	Cost	
<input checked="" type="checkbox"/>	fuel		5 Liter	\$150.00	<input type="button" value="Assign"/>

Assignment cost = 5 liter x \$30 per liter = \$150

Assigning material resource will not do work → no effect on task duration

## Lesson objectives

- Delay the start of work for a resource assigned to a task
- Unequal work resource assignment distribution using back-loaded contour
- Check individual resource remaining capacity per day, week, and month

# Delay the start of work resource assigned to a task

Assume social service project is assigned to a project assistance and monitoring office. The monitoring officer Can start the task later than the project assistance

## Open task usage view

Task Mode	Task Name	Work	Duration	Start	Finish	Add New Column	Details	T	W	T	F	S	May 2, '21	S	M	T	W
★	equip the computer lab	14 days	7 days	Tue 4/27/21	Wed 5/5/21		Work	2d	2d	2d	2d				2d	2d	2d
	project assistance	7 days		Tue 4/27/21	Wed 5/5/21		Work	1d	1d	1d	1d				1d	1d	1d
	monitoring officer	7 days		Tue 4/27/21	Wed 5/5/21		Work	1d	1d	1d	1d				1d	1d	1d

**FORMAT**

Baseline Work  Outline Number  Project Summary Task  Summary Tasks

Cost  Actual Cost

Add Details  Information Notes

---

**Assignment Information**

**General** | Tracking | Notes

Task: equip the computer lab

Resource: monitoring officer

Work: 7d Units: 100%

Work contour: Flat

**Start:** Fri 4/30/21 Booking type: Committed

Finish: Wed 5/5/21 Cost: \$0.00

Cost rate table: A Assignment Owner:

Both project assistance and monitoring office Start work at the same time, Tuesday

Details	T	W	T	F
Work	1d	1d	1d	2d
Work	1d	1d	1d	1d
Work	0d	0d	0d	1d

3 days delayed for monitoring officer And starts on Friday

# Unequal time distribution for a work resource assignment

- If a resource is scheduled for 2 day work each 8 hours, the assignment will equally apply 8 hours to day 1 and 8 hours to day 2
- Sometimes we hire new employee (resource) and we want first day to work 2 hours training only, and second day 14 hours
- We can use contour to distribute work over the scheduling time unequally (first day less work, and then gradual increase)

monitoring officer	10 days	Mon 3/15/21	Fri 3/26/21	Work	1d	1d	1d	1d	1d			1d	1d	1d	1d	1d
--------------------	---------	-------------	-------------	------	----	----	----	----	----	--	--	----	----	----	----	----

Monitoring officer is assigned to task for 10 working days, 1 day equally distributed  
But we want less time in the first days, and more work in later days

**Task Information** 1

General | Predecessors | Resources | Advanced | Notes | Custom Fields

Name: Five classes buidling Duration: 10 days  Estimated

Constrain task

Deadline: NA

Constraint type: As Soon As Possible Constraint date: NA

Task type: Fixed Duration  Effort driven

**Assignment Information** 2

General | Tracking | Notes

Task: Five classes buidling

Resource: monitoring officer

Work: 10d Units: 330%

Work contour: Back Loaded

Start: Mon 3/15/21 Booking type: Committed

Finish: Fri 3/26/21 Cost: \$0.00

Cost rate table: A Assignment Owner:

monitoring officer	6 days	Mon 3/15/21	Fri 3/26/21	Work	0.1d	0.15d	0.25d	0.5d	0.5d			0.75d	0.75d	1d	1d	1d
--------------------	--------	-------------	-------------	------	------	-------	-------	------	------	--	--	-------	-------	----	----	----

# Remaining resource capacity per day, week, and month

Open **resource usage** view, and set zoom timescale to weeks

The screenshot shows a software interface with a 'FORMAT' tab selected. Under 'Details', the 'Remaining Availability' checkbox is checked and circled in red. Below the settings is a table showing resource usage for a 'Vehicle' resource.

		May				June
		5/2	5/9	5/16	5/23	5/30
Details						
Rem. Avail.	24 hrs	40h	40h	40h	40h	48h
Work						24h

↓

Vehicle capacity is 8 hours by 5 days calendar  
Hence work per week = 40 hours  
Its has work of 24 hours (3 days)  
Remaining availability = 3 x 16 hours = 48 hours

## Lesson objectives

- Resource allocation states
- Level over allocated resources
- Project cost (budget)

# Resource allocation

This applies to work resource which affect project duration. Cost and material resources do not do work

- *Under allocated* (resource assignment < resource capacity)
- *Fully allocated* (resource assignment = resource capacity)
- *Over allocated* (resource assignment > resource capacity)

Resource Name	Work	Add New C	Details	T	F
▲ foreman4	32 hrs		Work	16h	16h
one library	16 hrs		Work	8h	8h
site visit	16 hrs		Work	8h	8h

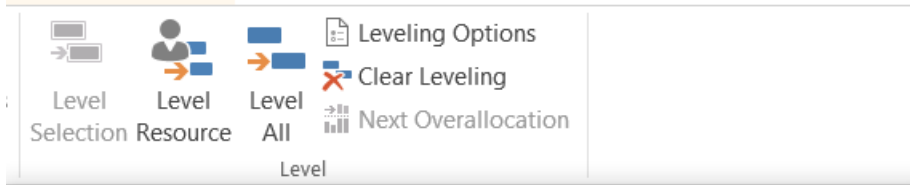
Foreman4 is over allocated

Assigned to two parallel task that start on Tuesday  
Instead of 8 hour capacity, he is working 16 hours



# Level over allocated resource

Open resource sheet view and spot over allocated resource marked red



Resource Leveling

Leveling calculations

Automatic  Manual

Look for overallocations on a  basis

Clear leveling values before leveling

Leveling range for 'Pure training center construction project'

Level entire project  Level

From:

To:

Resolving overallocations

Leveling order:

Level only within available slack

Leveling can adjust individual assignments on a task

Leveling can create splits in remaining work

Level resources with the proposed booking type

Level manually scheduled tasks

Buttons: Help, Clear Leveling..., Level All, OK, Cancel

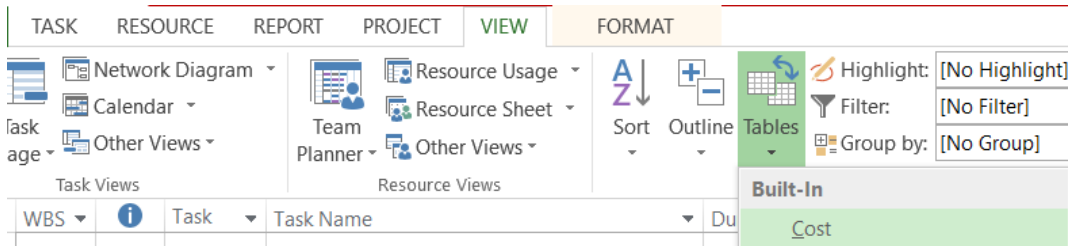
Use this option in the execution phase  
To level remaining assignments only

Resource Name	Work	Add New C	Details	T	F	S	Apr 11, '21	S	M	T
foreman4	32 hrs		Work	8h	8h				8h	8h
site visit	16 hrs		Work	8h	8h					
one library	16 hrs		Work						8h	8h

# Project cost (budget)

Open task sheet view, then select **tables < cost**, and then **tables < summary**

Total project cost = \$1,780  
Baseline cost = \$890



Project total cost and total duration  
Can be viewed from  
**Project information < statistics**

	Start	Finish
Current	Wed 3/10/21	Tue 6/15/21
Baseline	Wed 3/10/21	Mon 5/24/21
Actual	Wed 3/10/21	NA
Variance	0d	16d

	Duration	Work	Cost
Current	69d?	408h	\$1,780.00
Baseline	53d	440h	\$890.00
Actual	2.23d	8h	\$50.00
Remaining	66.77d?	400h	\$1,730.00

Percent complete:  
Duration: 3%      Work: 2%

Close

Task Name	Fixed	Fixed Cost	Total	Baseline	Variance	Actual	Remaining
<b>▲ Pure training center construction project</b>	<b>\$0.00</b>	<b>Prorated</b>	<b>\$1,780.00</b>	<b>\$890.00</b>	<b>\$890.00</b>	<b>\$50.00</b>	<b>\$1,730.00</b>
design phase	\$0.00	Prorated	\$75.00	\$75.00	\$0.00	\$50.00	\$25.00
<b>▲ construction phase</b>	<b>\$0.00</b>	<b>Prorated</b>	<b>\$435.00</b>	<b>\$735.00</b>	<b>(\$300.00)</b>	<b>\$0.00</b>	<b>\$435.00</b>
Five classes building	\$0.00	Prorated	\$0.00	\$470.00	(\$470.00)	\$0.00	\$0.00
one meeting hall	\$0.00	Prorated	\$250.00	\$250.00	\$0.00	\$0.00	\$250.00
two offices	\$0.00	Prorated	\$15.00	\$15.00	\$0.00	\$0.00	\$15.00
site visit	\$0.00	Prorated	\$160.00	\$0.00	\$160.00	\$0.00	\$160.00
one library	\$0.00	Prorated	\$10.00	\$0.00	\$10.00	\$0.00	\$10.00
three toilets	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>▲ building equipping phase</b>	<b>\$0.00</b>	<b>Prorated</b>	<b>\$130.00</b>	<b>\$80.00</b>	<b>\$50.00</b>	<b>\$0.00</b>	<b>\$130.00</b>
Equip the two offices	\$0.00	Prorated	\$50.00	\$0.00	\$50.00	\$0.00	\$50.00
equip the computer	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
equip the library	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Setup internet	\$0.00	Prorated	\$80.00	\$80.00	\$0.00	\$0.00	\$80.00
<b>▲ M &amp; E</b>	<b>\$0.00</b>	<b>Prorated</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>
M & E 1	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
M & E 2	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
construction complete	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>▲ semester starting phase</b>	<b>\$0.00</b>	<b>Prorated</b>	<b>\$1,140.00</b>	<b>\$0.00</b>	<b>\$1,140.00</b>	<b>\$0.00</b>	<b>\$1,140.00</b>
hire administration	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
hire lecturers	\$500.00	Start	\$500.00	\$0.00	\$500.00	\$0.00	\$500.00
students enrollment	\$0.00	Prorated	\$240.00	\$0.00	\$240.00	\$0.00	\$240.00
staff salary	\$400.00	Start	\$400.00	\$0.00	\$400.00	\$0.00	\$400.00

## Lesson objectives

- Custom resource groups

# Custom resource groups based on cost

## Open resource sheet view

VIEW **FORMAT** 1

Resource Usage ▾  
Resource Sheet ▾  
Resource Views ▾

Highlight: [No Highlight] ▾ Timescale: Days ▾  
Filter: [No Filter] ▾  
Group by: [No Group] ▾

**Built-In**  
[No Group]  
Assignments Keeping Outline Structure  
Complete and Incomplete Resources  
**Resource Group**  
Resource Type  
Standard Rate  
Clear Group  
New Group By...  
More Groups...

More Groups

Groups:  Task  Resource

- No Group
- Assignments Keeping Outline Structure
- Complete and Incomplete Resources
- Resource Group**
- Resource Type
- Standard Rate
- Work vs. Material Resources

New...  
Edit...  
Copy...  
Organizer...

Apply Cancel

Group Definition in 'Pure training center construction project' 2

Name: Copy of Resource &Group  Show in menu

	Field Name	Field Type	Order
Group By	Group	Resource	Ascending
Then By	Cost	Resource	Descending
Then By			

Group assignments, not resources

Group by setting for Cost

Font: Segoe UI 10 pt, Bold Font...

Cell background:

Pattern:

Define Group Intervals...

Show summary tasks  
 Maintain hierarchy

Help

3

Resource Name	Group	Max.	Pe	Std. Rate	Ovt. Rate	Cost	Work
<b>Group: No Value</b>		<b>1,050%</b>	<b>50%</b>			<b>\$880.00</b>	<b>51 days</b>
<b>Cost: \$200.00 - &lt;\$300.00</b>		<b>150%</b>	<b>50%</b>			<b>\$440.00</b>	<b>7 days</b>
Construction firm		50%	50%	\$50.00/day	\$0.00/hr	\$200.00	4 days
Vehicle		100%	100%	\$80.00/day	\$0.00/hr	\$240.00	3 days
<b>Cost: \$100.00 - &lt;\$200.00</b>						<b>\$150.00</b>	
fuel				r/day	\$30.00	\$150.00	5 Liter
<b>Cost: \$0.00 - &lt;\$100.00</b>		<b>900%</b>	<b>100%</b>			<b>\$290.00</b>	<b>44 days</b>

Cost = pay rate x work

## Lesson objectives

- Report schedule variance
  - Did tasks start and finish on time?
- Report cost variance
  - Did tasks run under budget or over budget?

# Report slipping tasks

Communicating project status to key stakeholders, such as customers and sponsors, is the most important function of a project manager

In real cases, scheduled and what is actually realized differ

$$\text{Work variance} = \text{scheduled} - \text{actual}$$

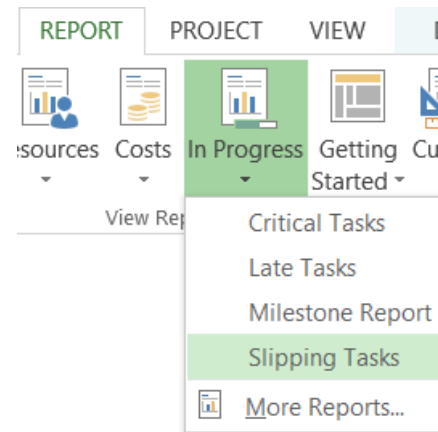
$$\text{Cost variance} = \text{scheduled} - \text{baseline}$$

Project Statistics for 'Pure training center construction project.mpp' X

	Start	Finish
Current	Wed 3/10/21	Tue 6/8/21
Baseline	Wed 3/10/21	Mon 5/24/21
Actual	Wed 3/10/21	NA
Variance	0d	11d

In this example, finish date has slipped by 11 days

You can also **variance table** to view schedule, baseline and variance for each task



What is the difference between status report and progress report?

# Report task and resource cost

*Current cost = actual cost value – remaining cost value*

Task cost over budget when *actual cost > baseline cost*

Open task sheet, then **tables < cost**

Task Name	Fixed	Fixed Cost	Total	Baseline	Variance	Actual	Remaining
▾ Pure training center construction project	\$0.00	Prorated	\$1,780.00	\$890.00	\$890.00	\$50.00	\$1,730.00
design phase	\$0.00	Prorated	\$75.00	\$75.00	\$0.00	\$50.00	\$25.00
▾ construction phase	\$0.00	Prorated	\$435.00	\$735.00	(\$300.00)	\$0.00	\$435.00
Five classes buidling	\$0.00	Prorated	\$0.00	\$470.00	(\$470.00)	\$0.00	\$0.00

Open resource sheet, then **tables < cost**

Resource Name	Cost	Baseline Cost	Variance	Actual Cost	Remaining
▾ Group: No Value	\$880.00	\$890.00	(\$10.00)	\$50.00	\$830.00
▾ Cost: \$200.00 - <\$300.00	\$440.00	\$450.00	(\$10.00)	\$50.00	\$390.00
Construction firm	\$200.00	\$450.00	(\$250.00)	\$50.00	\$150.00
Vehicle	\$240.00	\$0.00	\$240.00	\$0.00	\$240.00

**For the design phase task**

*Budgeted is \$75*

*We have used \$50 so far*

*We have only \$25 left*

**For the construction firm resource**

*Cost = \$450*

*Incurred cost so far = \$50*

*Remaining cost = \$390*

# Stoplight view of project report

Custom Fields

Field Type: Number

- Field
- Number1
- Number2
- overbudget (Number3)**
- Number4
- Number5
- Number6
- Number7
- Number8

Custom attributes

None  Lookup...  **Formula...**

Calculation for task and group summary rows

None  Rollup: Maximum  Use formula

Calculation for assignment rows

None  Roll down unless manually entered

Values to display

Data  **Graphical Indicators...**

Formula for 'overbudget'

overbudget =

[Cost Variance]

Insert: Field Function Import Formula...

OK Cancel

Variance	Actual	Remaining	overbudget
\$60.00	\$650.00	\$20,000.00	●
\$0.00	\$0.00	\$0.00	●
\$410.00	\$410.00	\$0.00	●

## Graphical Indicators for "overbudget"

Indicator criteria for

Nonsummary rows

Summary rows

Summary rows inherit criteria from nonsummary rows

Project summary

Project summary inherits criteria from summary rows

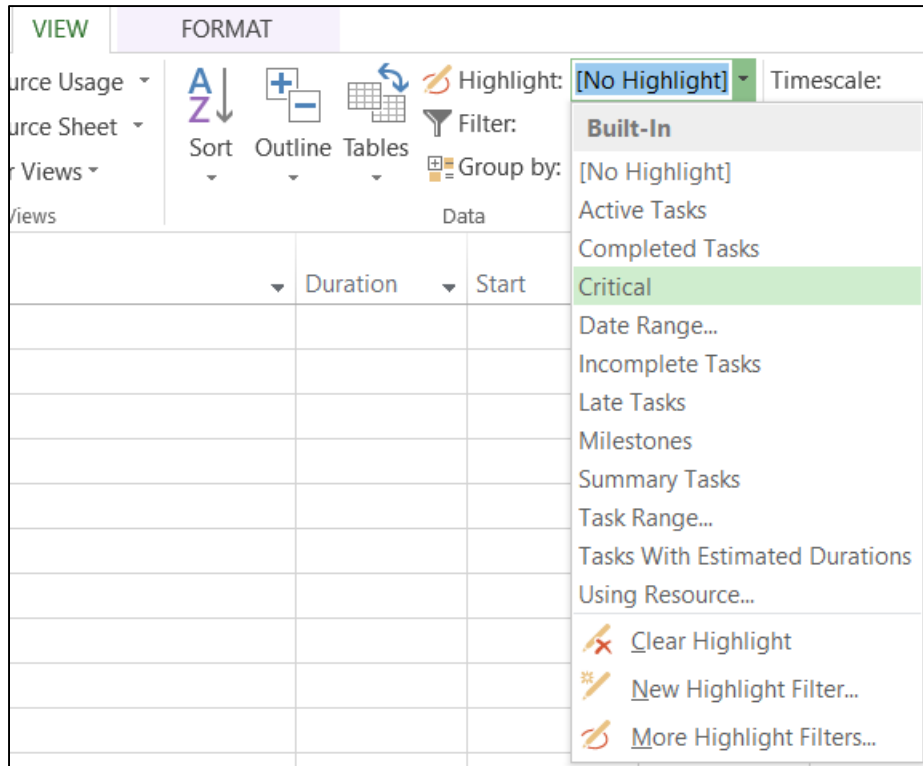
Cut Row Copy Row Paste Row Insert Row Delete Row

Test for 'overbudget'	Value(s)	Image
is less than or equal to	50.00	●
is greater than or equal to	50.00	●



# Critical path duration shortening (crushing)

Highlight critical path tasks on the Gantt view



This milestone task (construction complete) has exceeded its deadline on 24 May, and it is on critical path

Setup internet	2 days	Mon 5/24/21	Tue 5/25/21	
► M & E	2 days	Mon 4/26/21	Tue 4/27/21	
construction complete	0 days	Tue 5/25/21	Tue 5/25/21	

↓ To solve the missing deadline, we can crush (shorten) Duration of its predecessor task that has not yet completed

Setup internet	1 day	Mon 5/24/21	Mon 5/24/21	
► M & E	2 days	Mon 4/26/21	Tue 4/27/21	
construction complete	0 days	Mon 5/24/21	Mon 5/24/21	

You may need to increase resources for the crushed task. You can also increase overtime

Milestone task  
Deadline  
restored

Reduce duration but keep the same amount of work. Work distributed to the resources, 8 hours for each resource

# Project crushing by adding over time to assigned resources

Duration reduced to 0.75 days, but overtime increased to 2hrs. Same amount of work is performed by the resource

The screenshot shows the task details for 'Setup internet' with a duration of 0.75 days and a finish date of Mon 5/24/21. The task is set to 'Fixed Units' and is 0% complete. Below the task details is a resource table with the following data:

Resource Name	Units	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
internet			0h			
Engineer	100%	8h	2h	0h	0h	8h

If the resource has overtime pay rate, then project cost increases

The screenshot shows a resource table with the following data:

Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate
Engineer	Work		E		100%	\$15.00/day	\$0.00/hr

# Address budget problems by optimizing resource cost

Baseline cost was \$890  
 Current cost is \$1,791.25 → Project over-budget =  $890 / 1791.25 = 49.8\%$

	Duration	Work	Cost
Current	64d?	432h	\$1,791.25
Baseline	53d	440h	\$890.00
Actual	2.11d	8h	\$50.00
Remaining	61.89d?	424h	\$1,741.25

Right now, the vehicle resource takes the most Resource cost for the remaining tasks as shown below

Resource Name	Cost	Baseline	Variance	Actual Cost	Remaining
Vehicle	\$240.00	\$0.00	\$240.00	\$0.00	\$240.00
fuel	\$150.00	\$0.00	\$150.00	\$0.00	\$150.00
Construction firm	\$200.00	\$450.00	(\$250.00)	\$50.00	\$150.00
Engineer	\$86.25	\$195.00	(\$108.75)	\$0.00	\$86.25
internet	\$80.00	\$80.00	\$0.00	\$0.00	\$80.00
driver	\$50.00	\$0.00	\$50.00	\$0.00	\$50.00

The project manager will then check which tasks the vehicle resource is assigned to

Task Mode	Task Name	Duration	Start	Finish	% Complete	Resource Names	T	W	T	F	S
	students enrollment	3 days	Tue 6/1/21	Thu 6/3/21	0%	Vehicle					

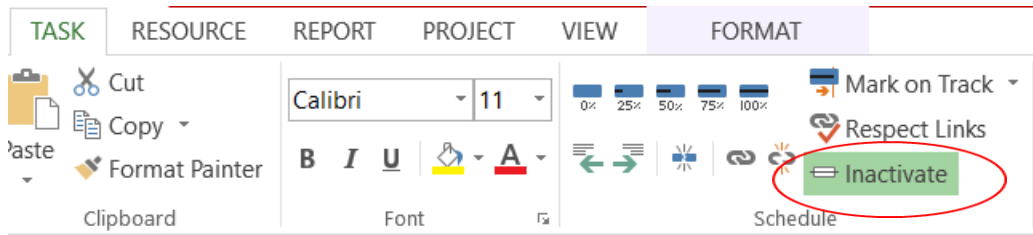
The vehicle resource is assigned to the register office team that will enroll students for 3 days at \$80 / day  
 After consulting with team, it was suggested 2 days would be enough

Resource Name	Cost	Baseline Cost	Variance	Actual Cost	Remaining
Vehicle	\$160.00	\$0.00	\$160.00	\$0.00	\$160.00

	Duration	Work	Cost
Current	64d?	424h	\$1,711.25

# Remove no-so-important tasks to reduce project cost

In some situations, the project sponsor may not approve your project plan because of over-budget  
You may then discuss with them reducing the number of tasks required, as those may be postponed later in Operational phase as project ends



Inactivated tasks will not effect Scheduling and cost



	Duration	Work	Cost
Current	64d?	416h	\$1,620.00
Baseline	53d	440h	\$890.00
Actual	2.17d	8h	\$50.00
Remaining	61.83d?	408h	\$1,570.00

Project cost reduced to \$1,620  
Duration not changed, but work reduced

One of the most important tasks required from the project manager is to *communicate and communicate* all the time

Various reports could be generated

- Completed tasks
- Incomplete tasks
- Cost over budget
- Milestones
- Critical tasks
- And so on

- End of project learning (stakeholder meeting)
- Verify scope and deliverables (work plan vs work completed)
- Evaluation of accomplishments
- Contracts closure (financial, supplier)
- Administrative (archives)
- Project handover to customer
- Final report and presentation that mirror project proposal