



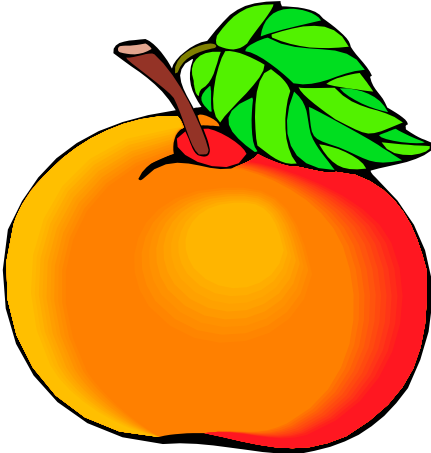
**University of
Nottingham**
UK | CHINA | MALAYSIA

Department of Mechanical, Materials and Manufacturing Engineering

Project Monitoring - Part 1

- *Prologue: supplying apples*
- *Context of project monitoring*
- *Definition of Earned Value Analysis (EVA)*

Prologue: Supplying apples



- Consider you are tasked with supplying six apples on six days.



Daily spend →

20p

20p

20p

20p

20p

20p

Total (cumulative)
spend →

20p

40p

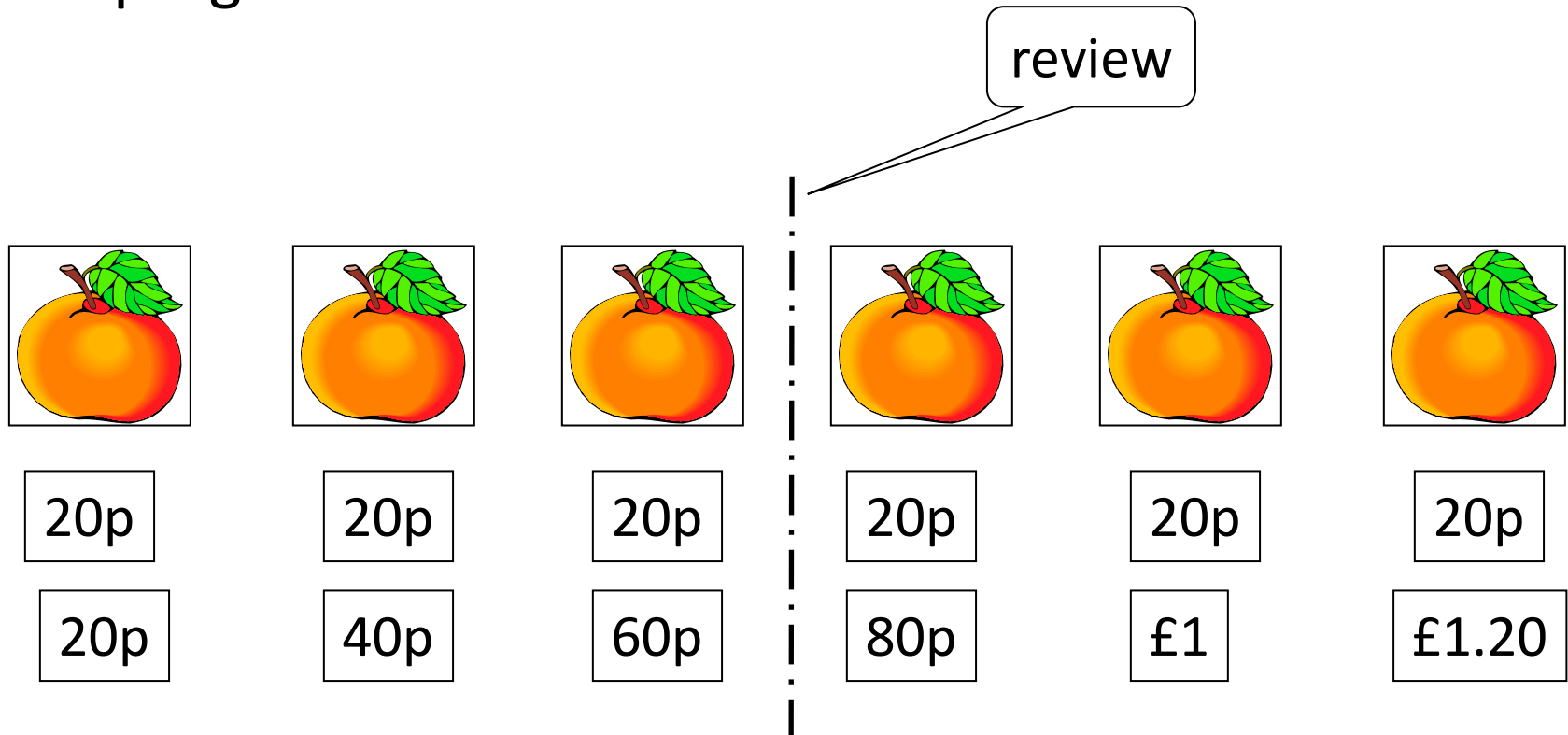
60p

80p

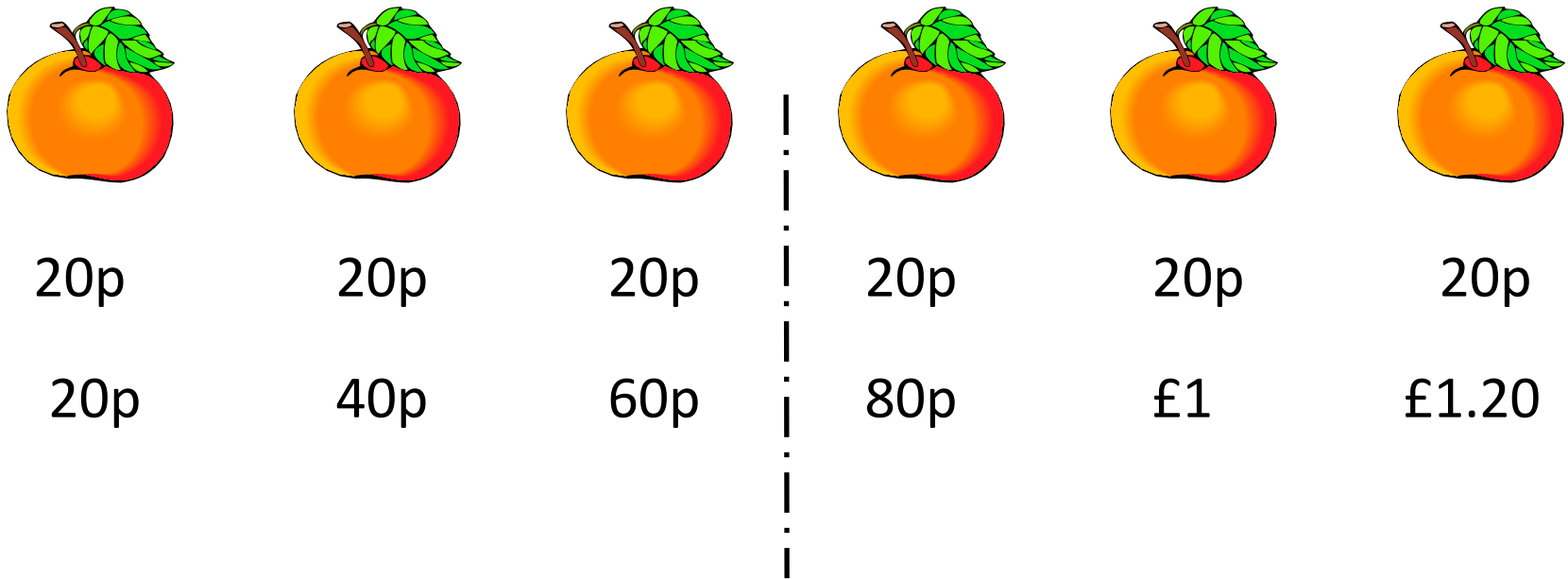
£1

£1.20

- Now consider there's a review after day 3 to monitor progress:

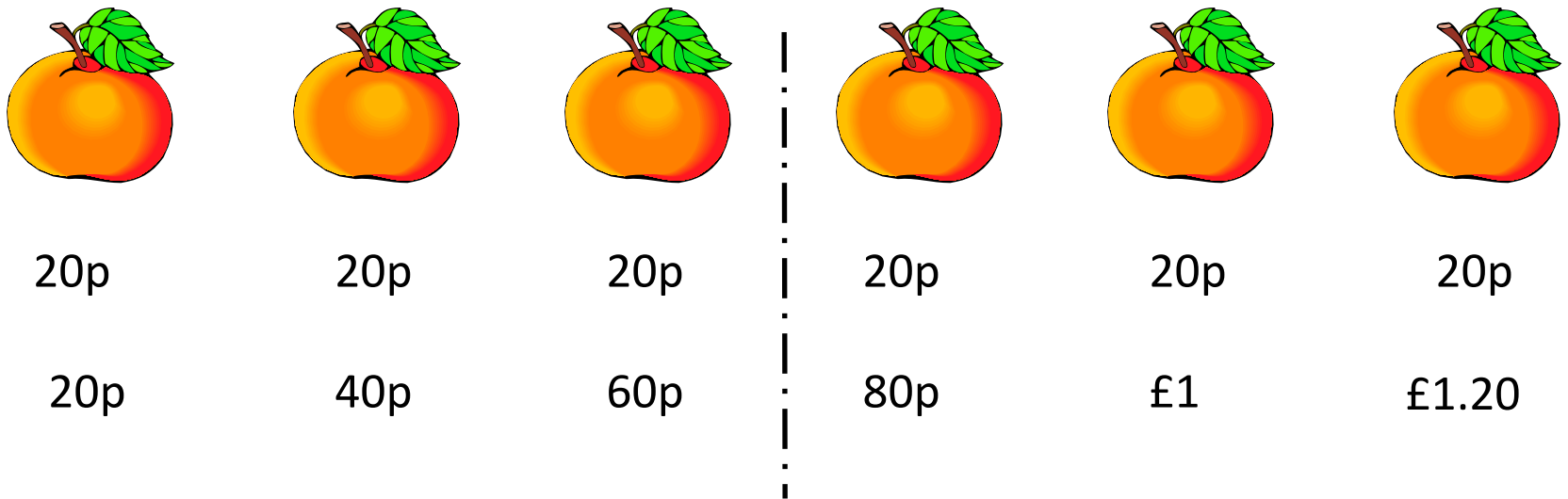


- What happens if the apples each cost what we expect but we have not spent our budget ?



→ Delivery running behind schedule

- Alternatively, what happens if the apples arrive to plan but the cost is higher than we predicted ?



→ We are overspending

What does our original plan look like?



20p

20p



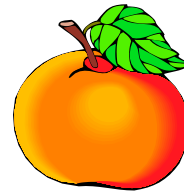
20p

40p



20p

60p



20p

80p



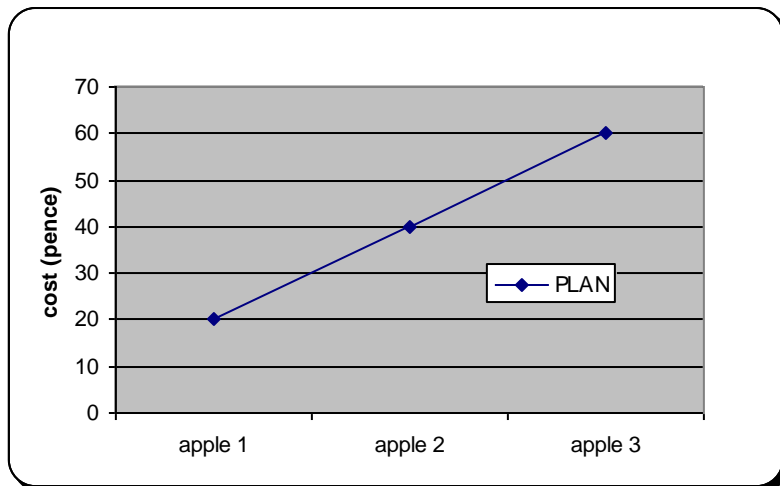
20p

£1



20p

£1.20



→ Same information shown in graphical form

Scenario 1: delivery behind schedule

- At the review we have spent only 40p

- Original plan (“budget”)



20p

20p



20p

40p

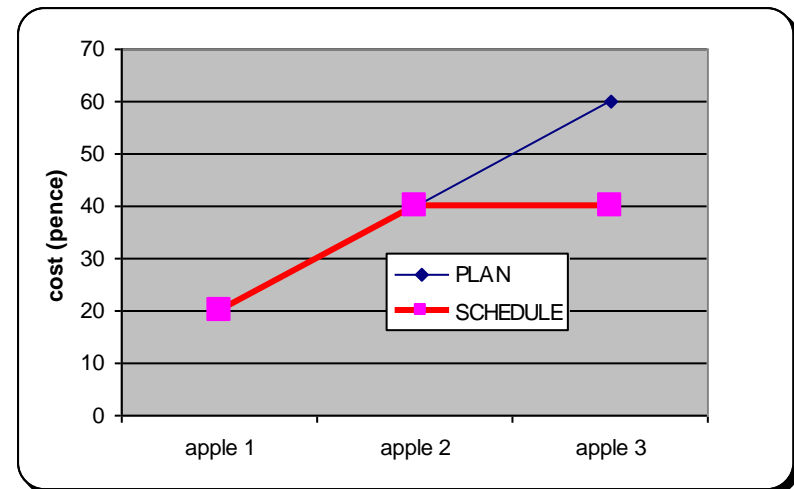
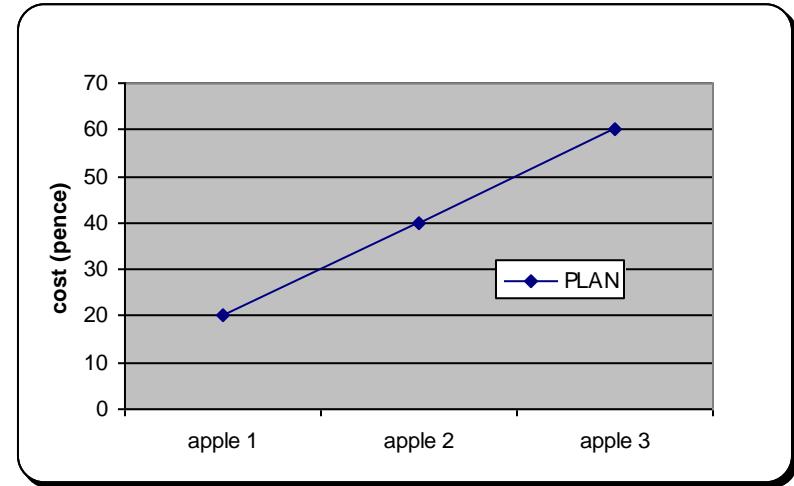


20p

60p



- What has really happened up to review



Scenario 2: cost over budget

- At the review we have spent 75p on three apples



20p

20p



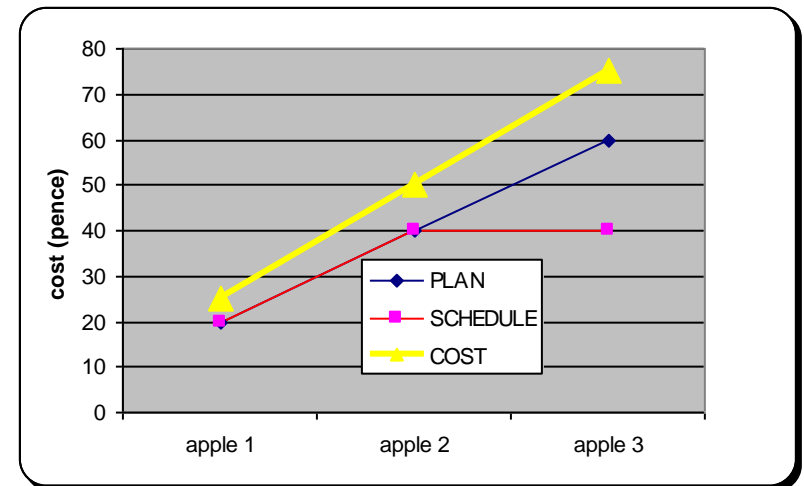
20p

40p

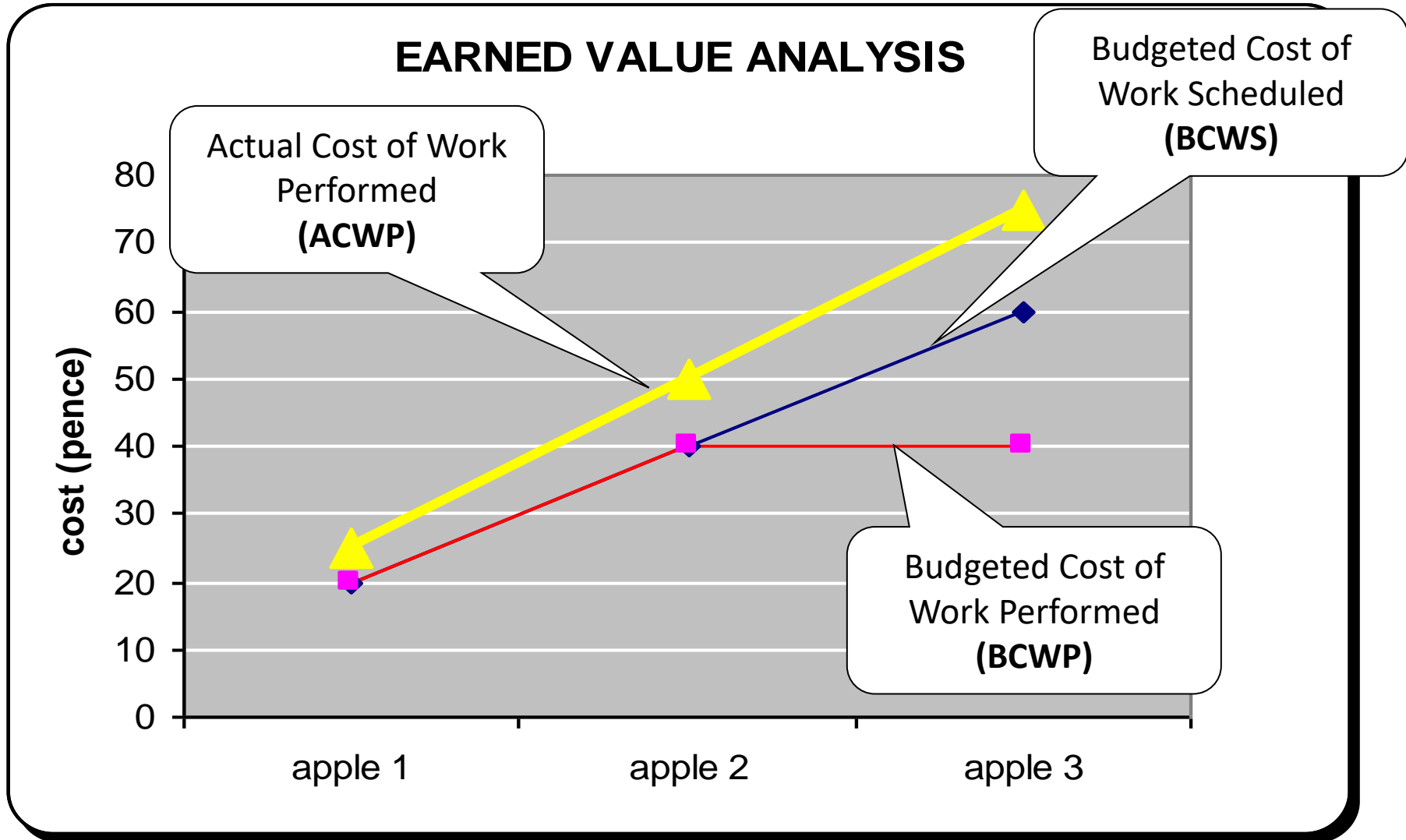


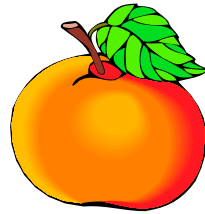
20p

60p



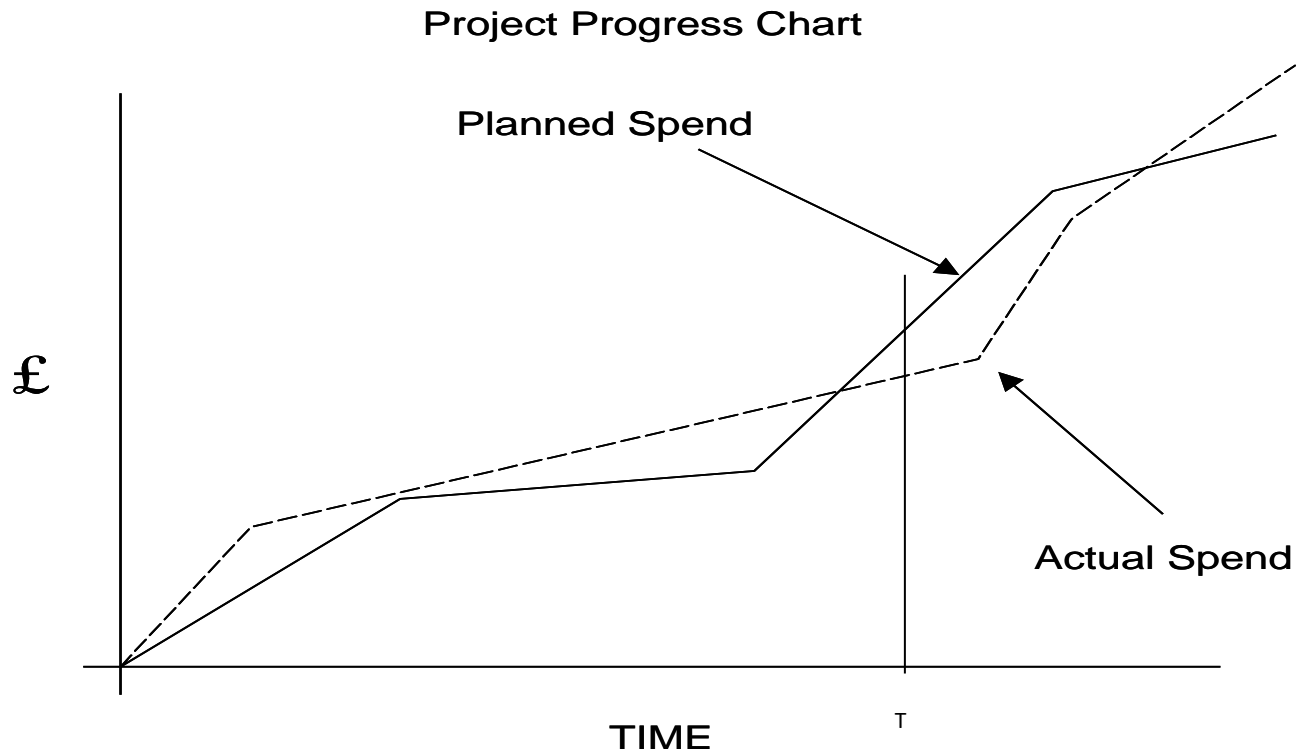
- Introducing today's main concepts on one slide...





STARTING THE LECTURE

Consider trying to monitor a programme by comparing planned spend vs. actual spend



**At the review our programme is under-spent.
But is this a good thing?**

Possible explanations for under-spend

- The project is running on time and is indeed costing less than expected – a good outcome



- The project is costing less than expected but this is because less work has been done than was planned – a bad outcome, because the hidden truth is that the programme is running late



- The project is running considerably late, so not only is it behind time but the work completed is possibly costing more than expected – clearly a bad outcome with the possibility of collapsing the whole project.



A possible solution

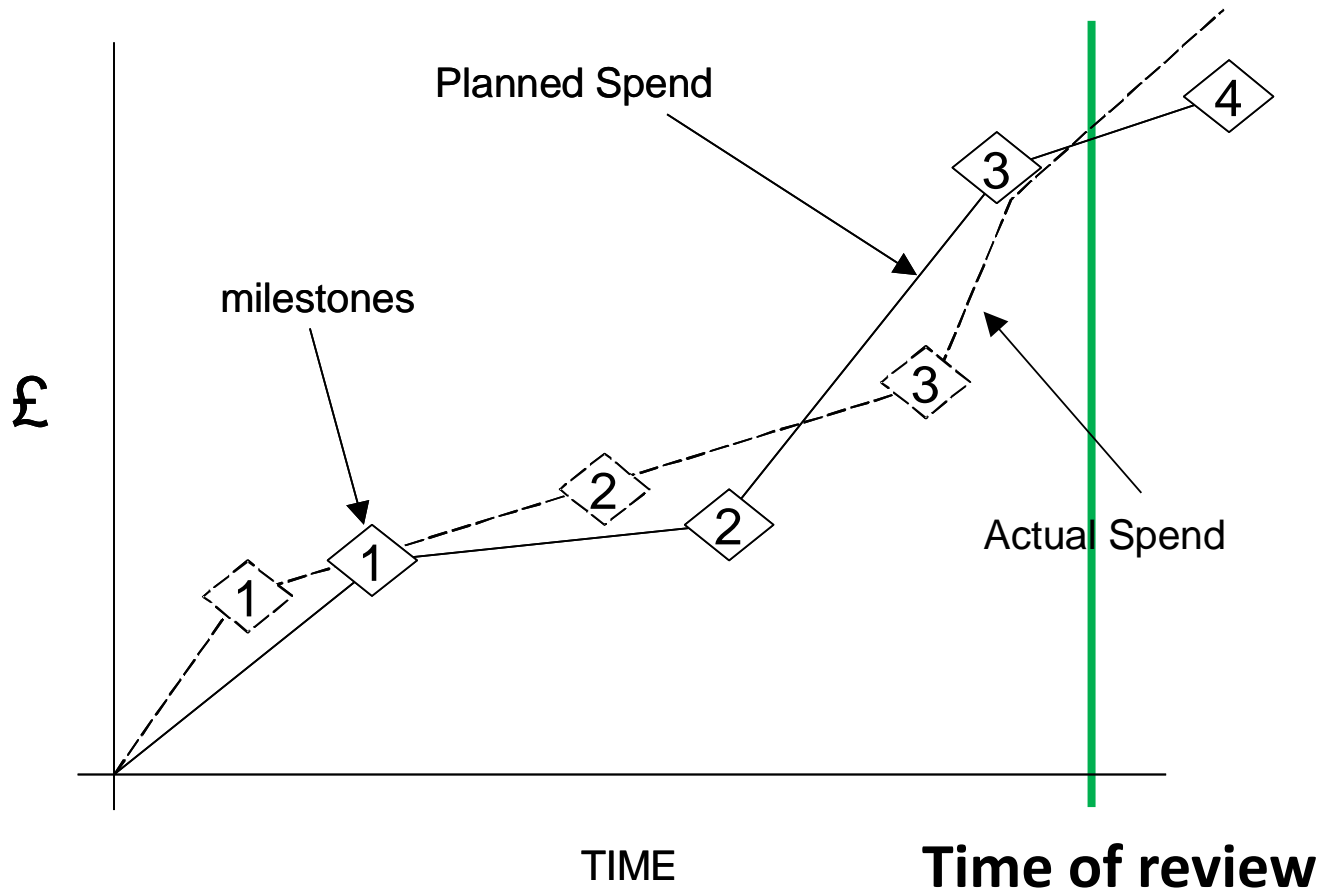
- Adding structure on the progress of the programme
- This can be done by adding **“Milestones”**
- Milestones are significant events such as “design complete” or “machine on order”
 - Often connected to “Deliverables”
- They must not be “soft” events, such as “meeting arranged” or “report started”

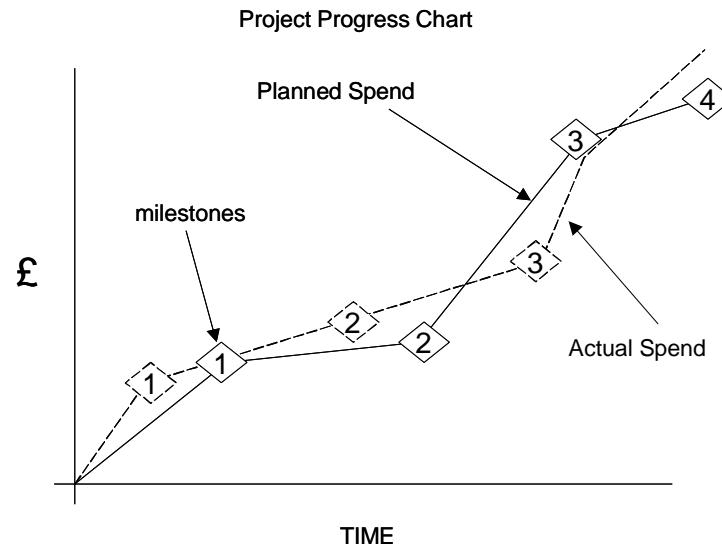


In the following example we have specified 4 milestones

- The first might be “project specification published” and the last “issue of final report”
- They are marked on the **predicted spend** line where they are expected to be completed
- As the project moves on, we mark them on the **actual spend** line as they occur

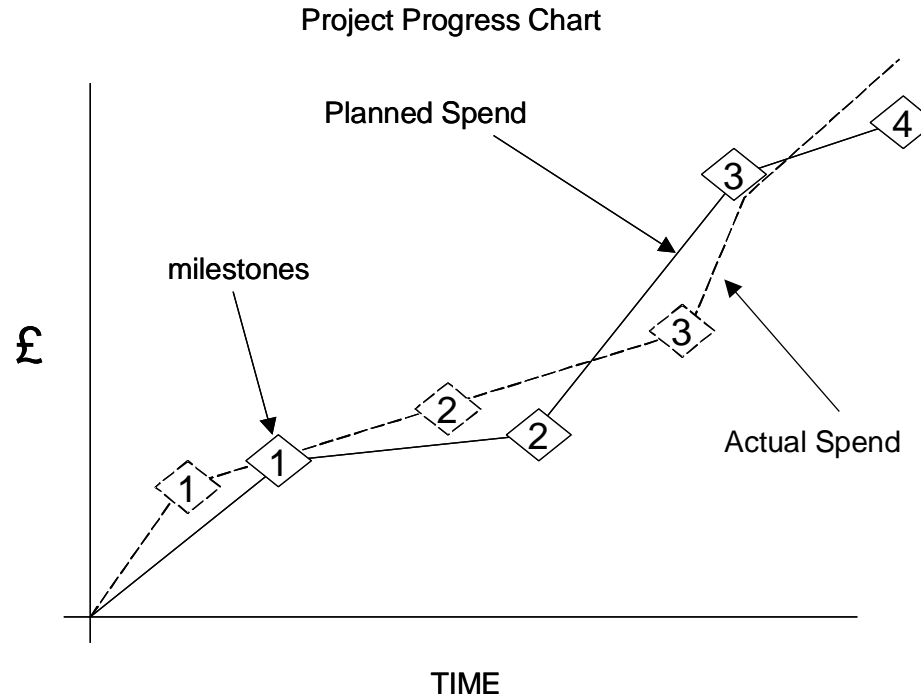
Project Progress Chart



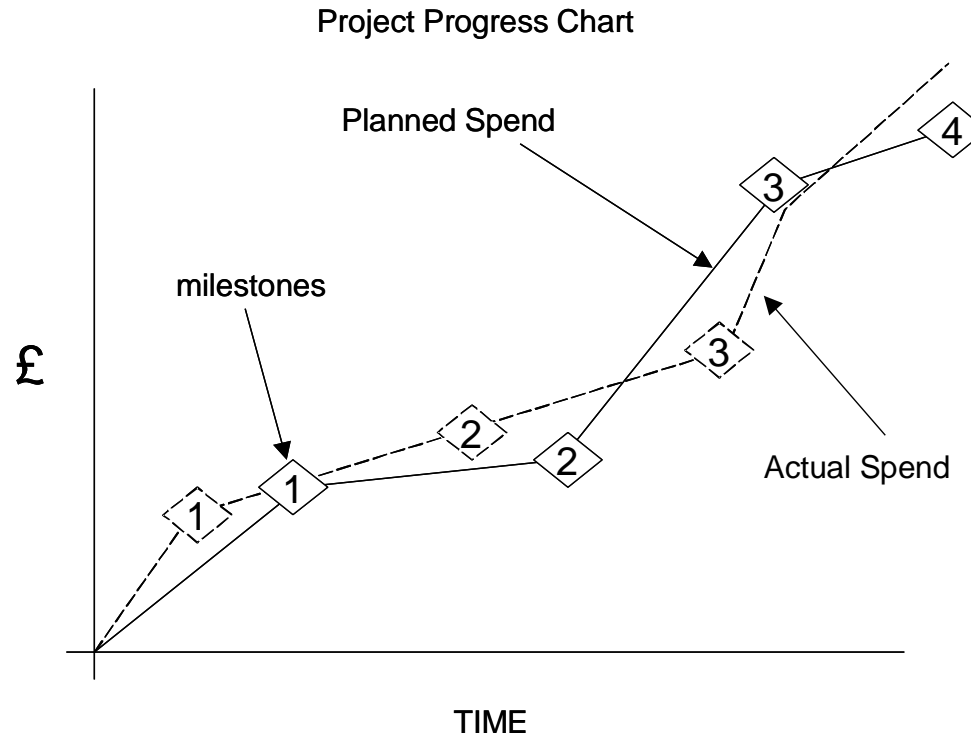


So, what can we say about our project now?

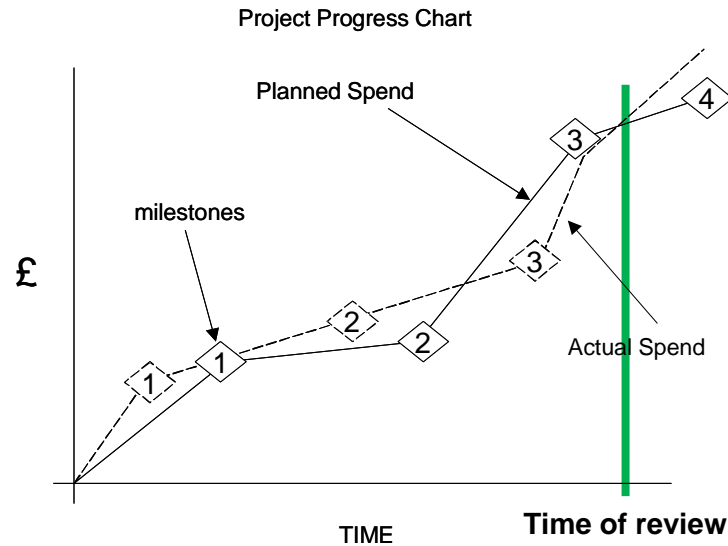
- The milestones allow us considerable insight into the progress
- We can be quite definite:
 - The **first milestone** is achieved ahead of schedule and slightly below the predicted spend.
 - At this stage the project is doing very well



- The **second milestone** is again achieved ahead of schedule but this time slightly above cost
- At this stage the programme manager has a number of options, such as to reduce the manpower on the project as it is running faster than expected
- This will however, bring the programme closer to the cost line



- The **third milestone** shows that the programme is still ahead of time and budget
- Note that the programme manager will often not want tasks to run too far ahead of time as it represents a higher rate of spend than is necessary



The **fourth milestone** has not yet been completed but the programme is once again above the planned cost.

- This is always a difficult situation for the programme manager, since she or he cannot simply use more resource to recover the time, as this would put the cost further beyond the budget
 - They have the option of slipping the project
 - Alternatively, they can re-plan the rest of the programme trying to carry tasks out in parallel by sub-contracting work



- The introduction of milestones enables us to extract much more information from the simple cost plot, almost giving it a third dimension
 - We can extend this principle by separating Cost and Schedule
- This is the basis of ***Earned Value Analysis***

Earned Value Analysis

So far in the course we have followed our through a number of phases, including

- Project Evaluation
- Planning



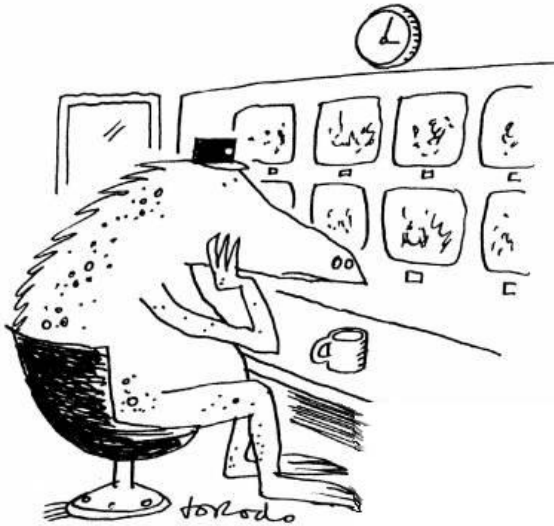
Now that the project is running we must be able to **MONITOR** the progress in a quantitative way:

- There are a number of ways to do this
- Earned Value Analysis (EVA) is a relatively simple method that allows us to evaluate the progress of the programme against both the original planned schedule and actual costs
- Most of the major Management Resource and Planning (MRP) computer packages use EVA as the basis of their project monitoring, e.g.





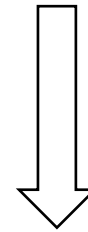
Key idea 1: monitoring a programme/project



MONITOR LIZARD

Monitoring (i.e. “watching”) always takes place from the perspective of a particular point in time → looking back at performance so far.

Time of review



Start of the project

time



Key idea 2: “budgeted cost”

Effectively introducing a further type of cost

- Unlike actual costs, budgeted costs are just assumed, they are not really incurred
- They exist only in the planned budget of the project
- In EVA, real incurred costs are denoted “actual costs”



