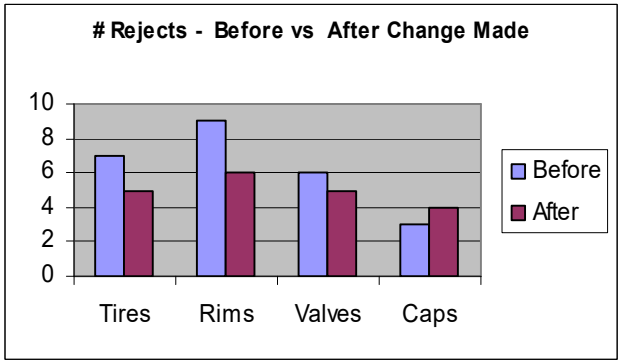
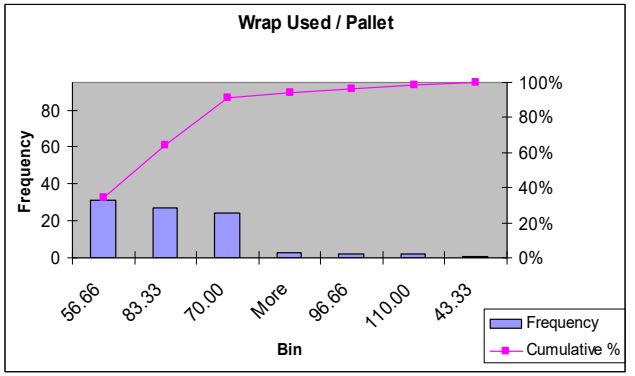
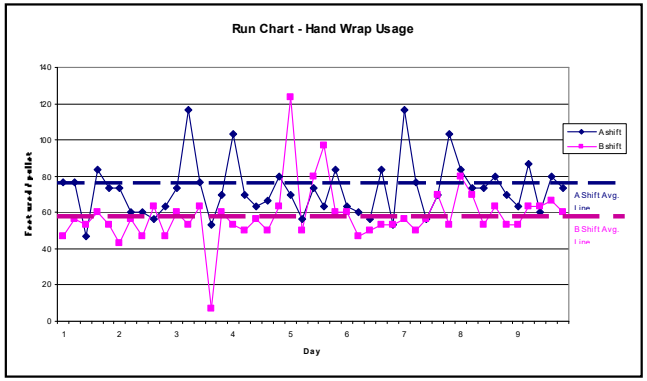




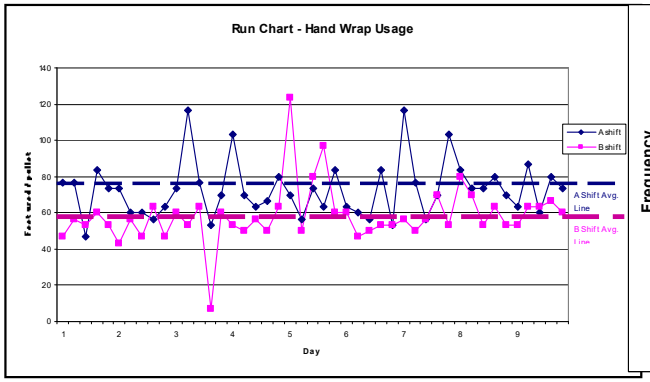
QC Tools Overview

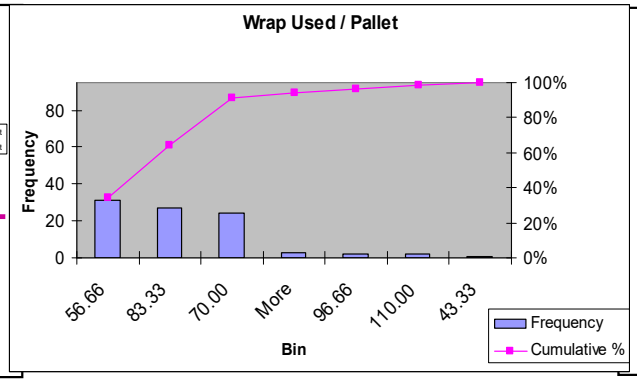
(For E-Circles)

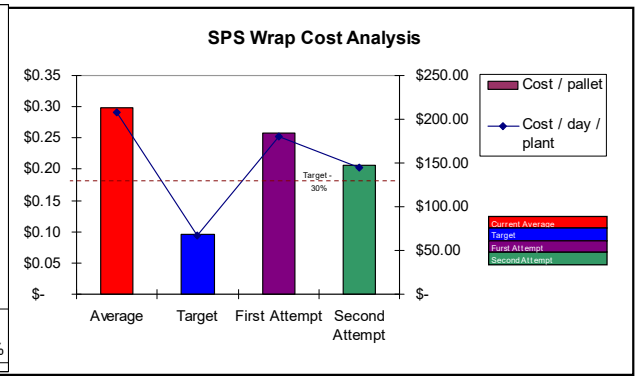


QC Tools Overview

- QC Tools are used to analyze, collect, and visually represent data collected and situations (processes).
- Today we will be discussing what type of graph to use for different types of data







Graphical Analysis

- Various graph types include:

  Bar and Column Graphs – (countable data)

  Pareto Charts – (countable data)

  Run Charts – (time bound)

  Pie Chart – (percent)

  Scatter Diagrams – (relationship of variables)

Bar and Column Graphs

- These are generally used when you have collected counting type data.

  # OF REJECTS PER ISSUE

  # OF MISSHIPMENTS PER CAUSE

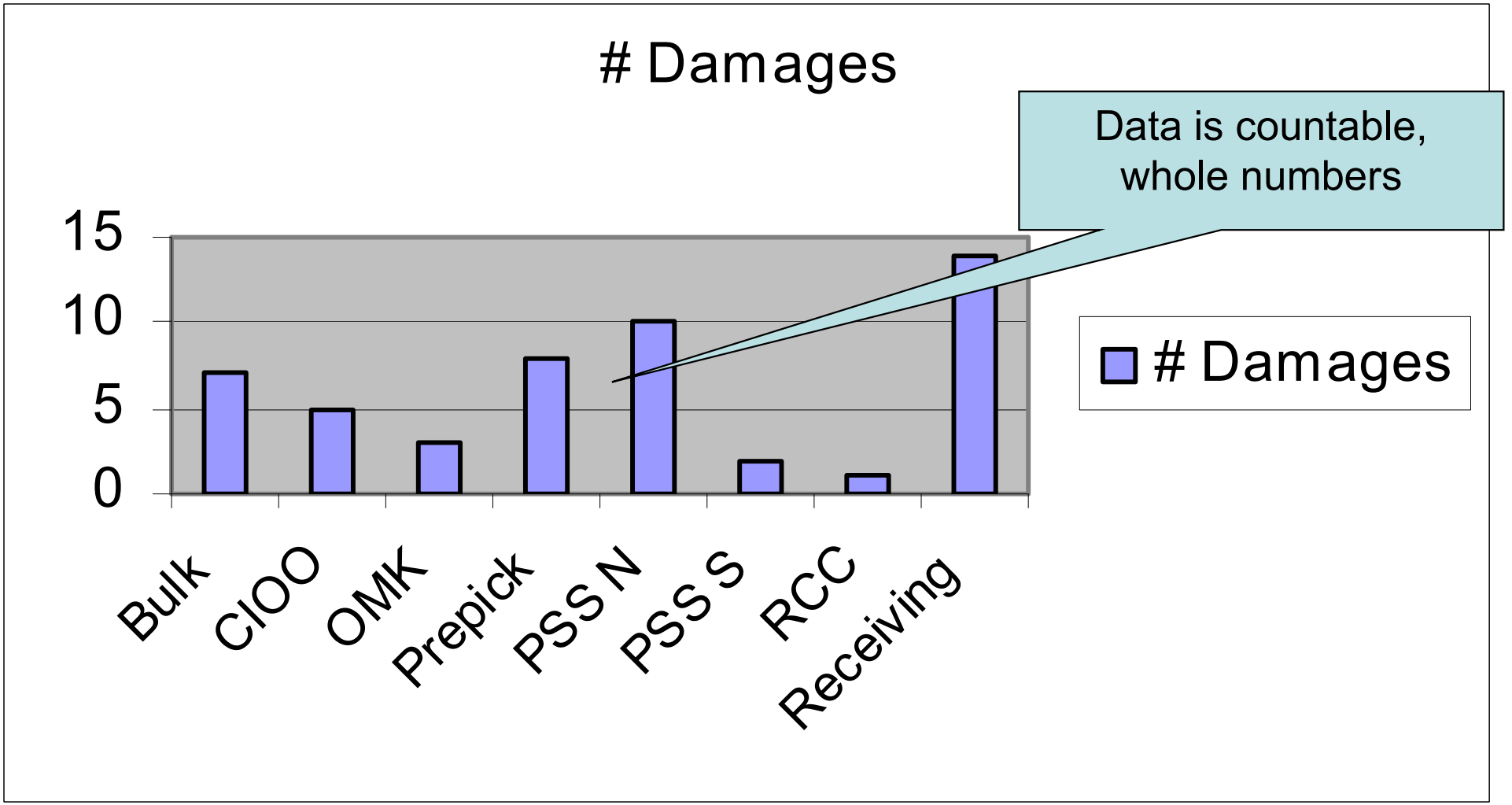
  Each sample of data is a whole number

  (ie 5 scratched rims, 1 misshipment from a no-scan out)

Bar and Column Graphs

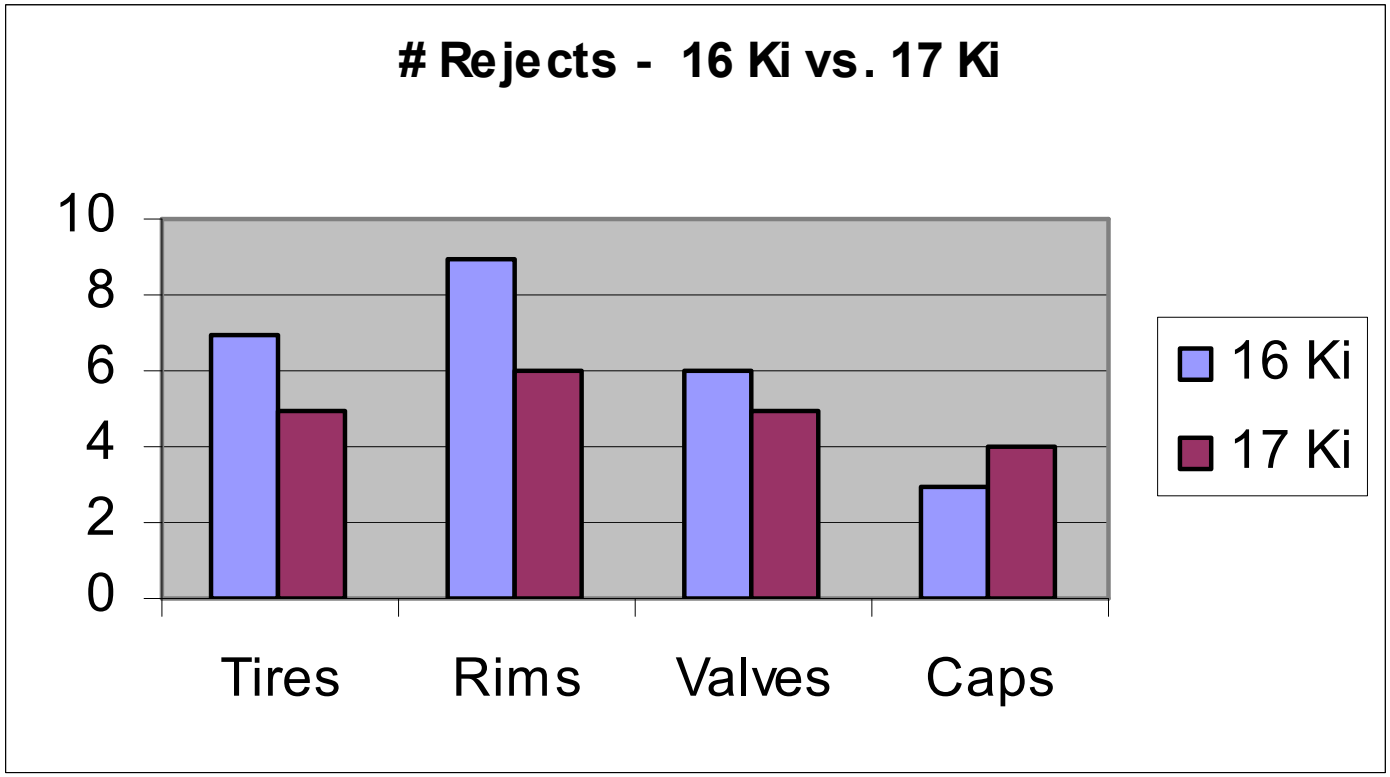
Example: What Section Damage Occurs In:

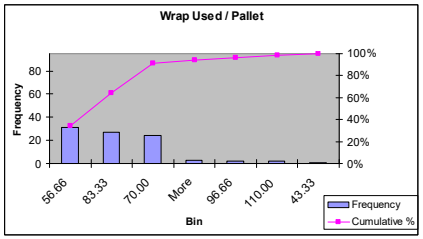
The data is in no specific order on a bar or column graph.



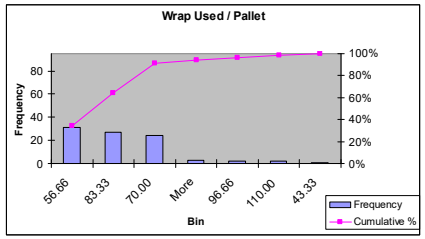
Bar and Column Graphs

- These can also be used to compare year over year when looking at measurables. (When a run chart would run off the page)





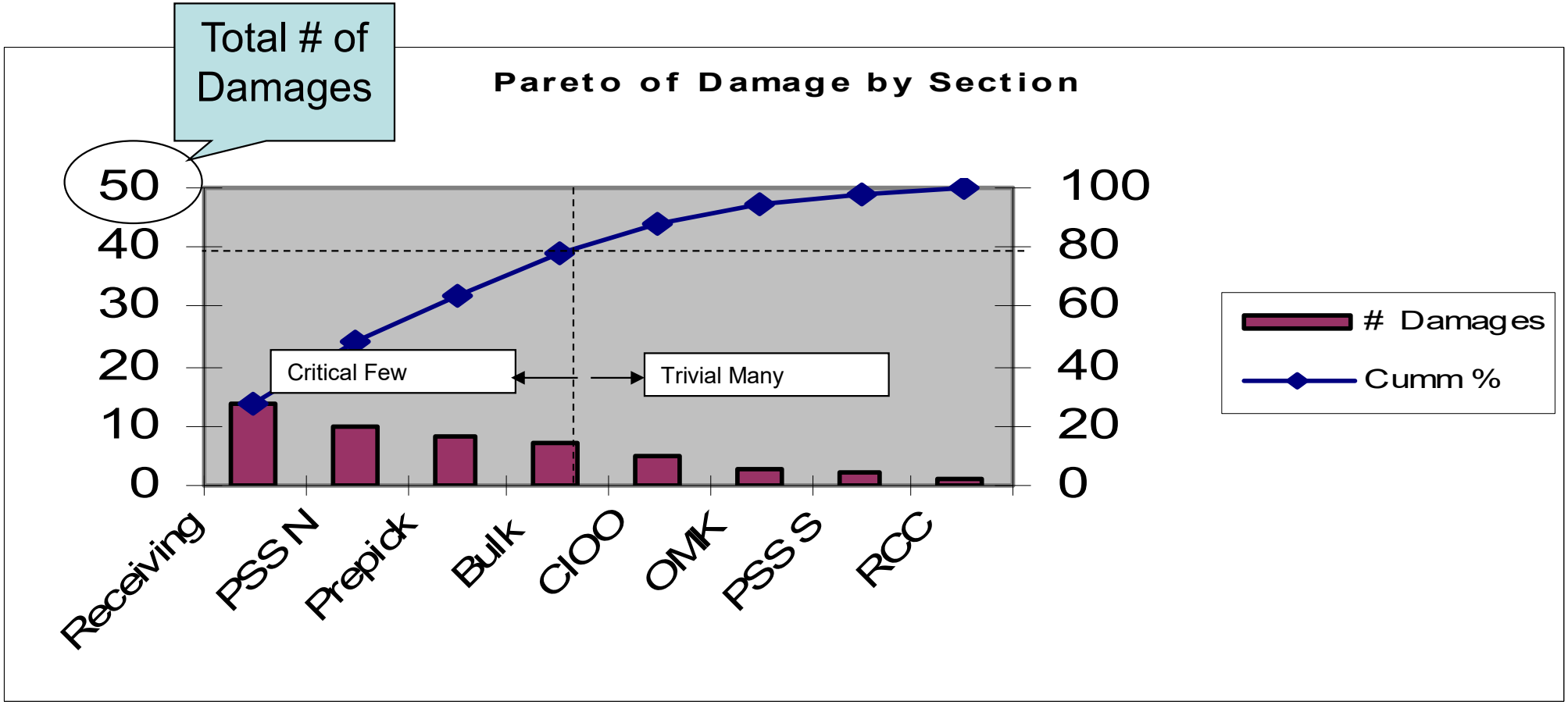
Pareto Chart



- If you take the same data from example 1 and analyze it cumulatively it is called a pareto chart.
- This type of chart shows the data from highest to lowest and has a line representing cumulative percent in order to show what needs the most attention.
- Use the 80 / 20 rule – 80% of your issues are from 20% of your causes
- The scale maximum for the bars is always the total # of issues. (add up all bars) This ensures your cumulative percent line touches the top of your first column.
- The percent line maximum is always 100%

Pareto Chart

Example: What Section Damage Occurs In



The hatched lines show the “80/20” rule – place one horizontally at 80% and another intersecting it vertically.

* If you deal with the “Critical Few” to the left of the vertical line you will eliminate 80% of your issues.

Run Charts

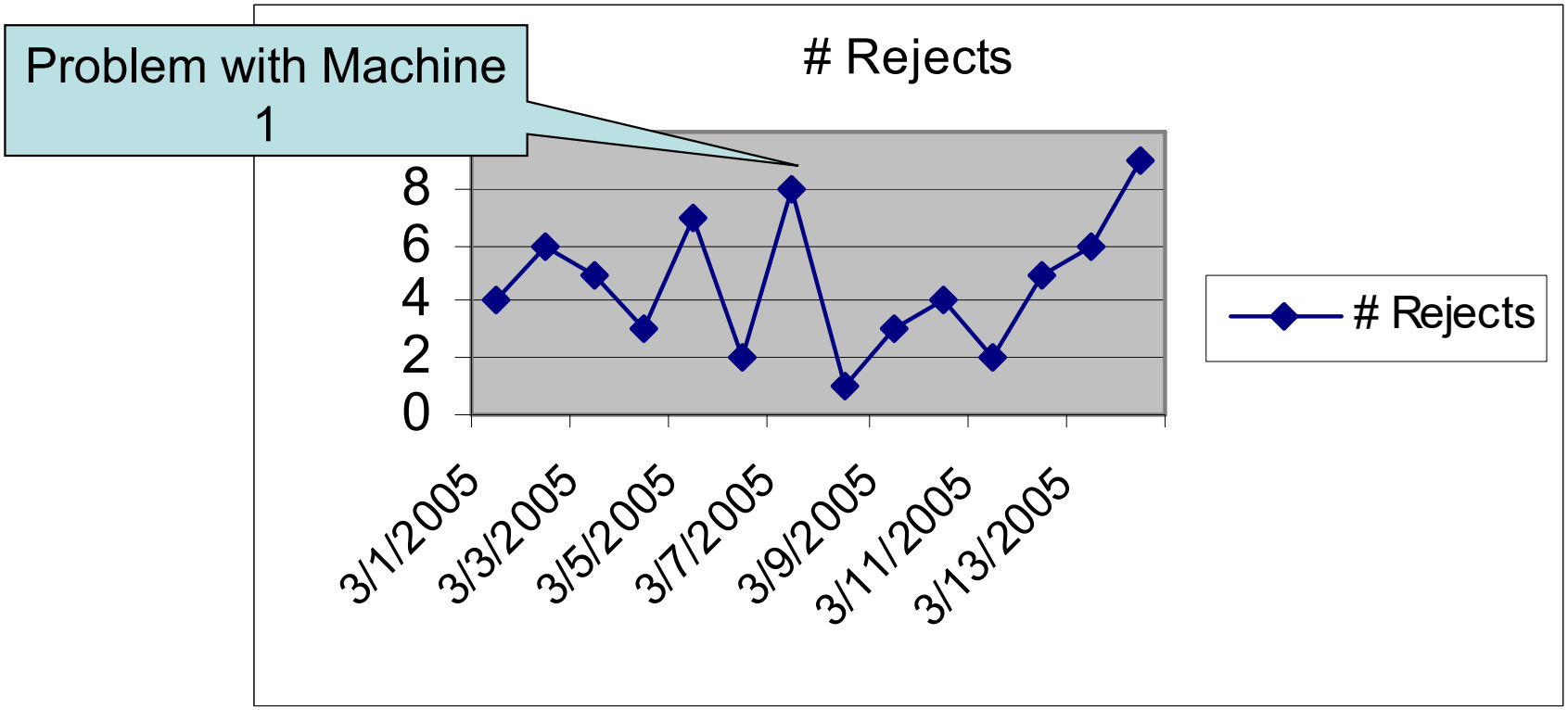
- Run charts are used when you have data collected over a set period of time.
  - Misshipments / day
  - Damage cost / day
  - # rejects / hour

  This type of chart show's history on issues / problems. (How did we do last week compared to this week?)

Run Chart

The chart below shows the results of data collection over a two week period.

From a Run Chart you can see when there are peaks in the data. You can then relate these peaks to things that happened. (We had a problem with Machine 1 on Mar 7, so that's why the reject rate was high on that day) You can also use a Run Chart to trigger investigating the peaks – what happened on the 14th?



Pie Graph

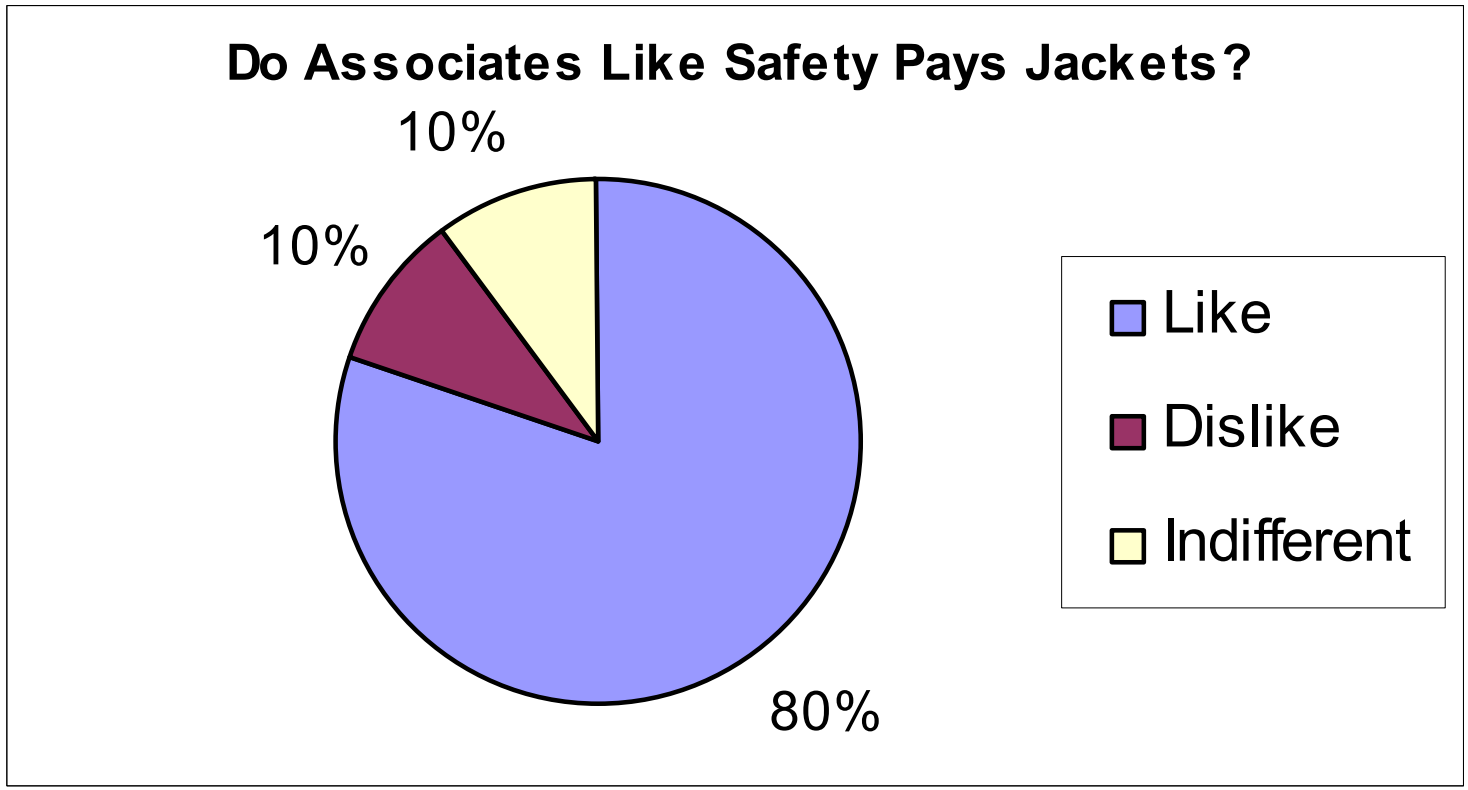
- These are used when you want to show how several items add up to make a whole.
- Pie charts can be used to show things like what percent of damages are caused by various items or results of surveys.

  (80% of associates like, 10% dislike, 10% indifferent)

Pie Graph

The chart below shows that 80% of Associates asked like the Safety Pays Jackets.

Pie Graphs are excellent tools for survey results as they give a very easily understood visual of the data. You can also add labels and percentages to make it even easier to understand.

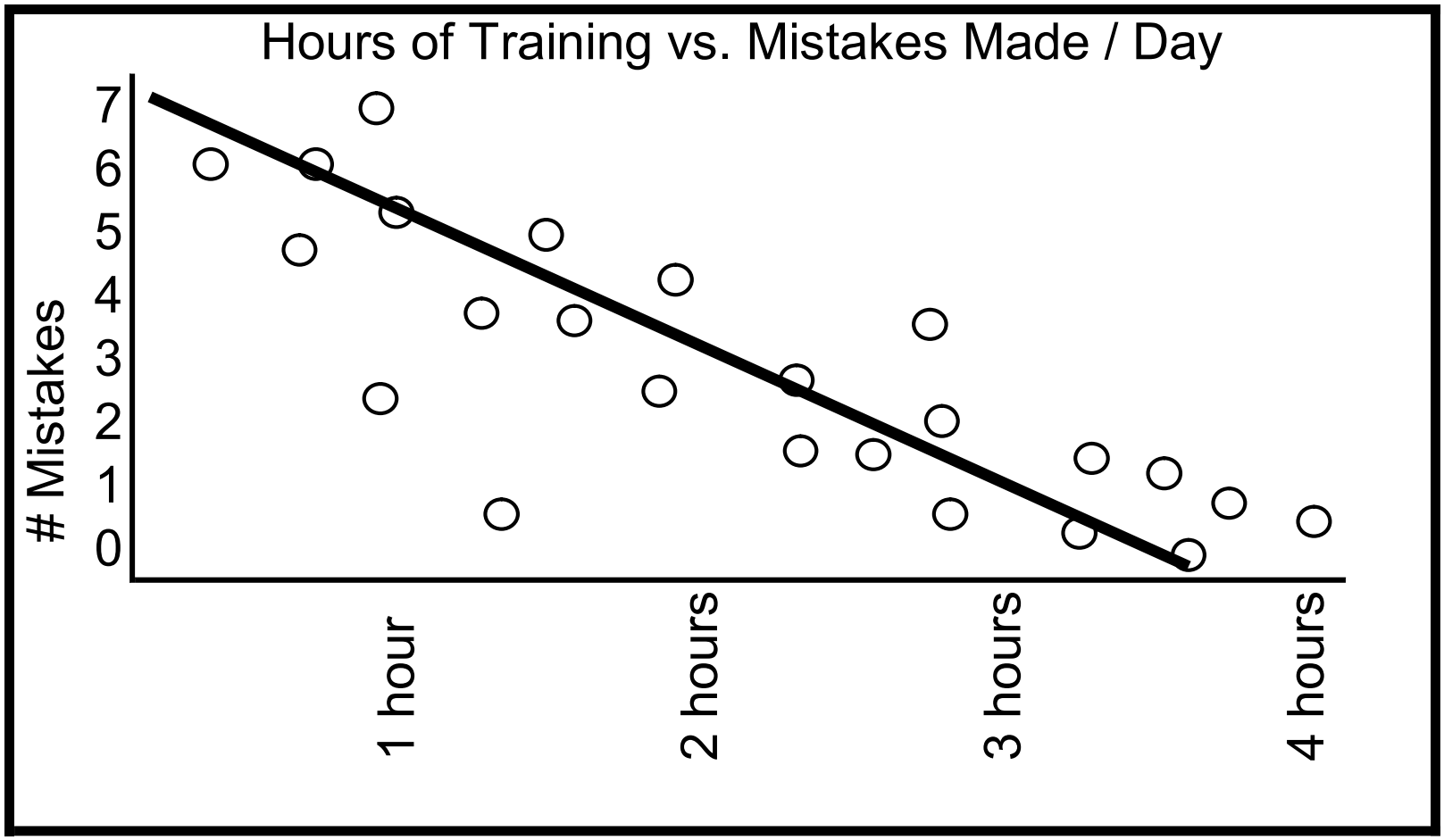


Scatter Diagrams

- These are used to see if there are patterns or correlations to data collected.
- You can use it to see if a change to one variable has an effect on another variable.
- For example, you can test to see if associates who receive 1 hour of training make less mistakes than those receiving 2-4 hours training.

Scatter Diagram

The points were plotted and a best fit line was drawn through the data to show the correlation between hours of training and mistakes made. You can see that as the hours of training increased, the # of mistakes decreased. This is a possible negative correlation.



QC Tools Overview

- *So the basic rules are:*

  Countable data = bar / column graph

  To find your biggest causes = pareto chart

  Time bound = run chart

  To look at how one variable affects another = scatter diagram

Which Graph Would I Use?

You have collected the results of an associate survey. What type of graph would you use to display the percent satisfied vs. unsatisfied?

Run Chart? Pie Graph? Bar Graph?

You plan on implementing a countermeasure to stop hand pack errors. You collect data both before and after you implemented your CM. What type of graph would you use to show the effect of your CM?

Pareto? Scatter Diagram? Run Chart?

You have picked the category of parts damage for your E-Circle. To determine what causes you should countermeasure (ie forklift, manual hand pack…) what kind of graph would you input the data into?

Run Chart? Pareto? Bar Graph?