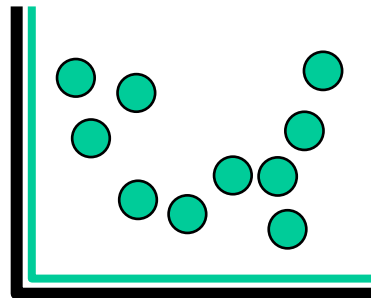


# Continuous Improvement Toolkit

## Scatter Plot



**Managing Risk**

PDPC  
FMEA RAID Logs  
Fault Tree Analysis  
Risk Assessment\*  
Traffic Light Assessment

**Deciding & Selecting**

Pros and Cons  
Break-even Analysis  
Force Field Analysis  
Decision Tree  
QFD  
Kano Analysis  
Critical-to Tree  
Cause & Effect Matrix  
Confidence Intervals  
Probability Distributions  
Graphical Analysis  
Run Charts  
Control Charts  
Sampling  
Brainstorming  
Nominal Group Technique  
Affinity Diagram  
Lateral Thinking

**Planning & Project Management\***

Importance-Urgency Mapping  
Cost -Benefit Analysis  
Voting  
TPN Analysis  
Prioritization Matrix  
Paired Comparison  
Pareto Analysis  
ANOVA  
Hypothesis Testing  
Correlation  
5 Whys  
Chi-Square Test  
Fishbone Diagram  
Analogy  
Mind Mapping\*  
Attribute Analysis  
Visioning  
SCAMPER\*\*\*  
TRIZ\*\*\*  
RACI Matrix  
Stakeholders Analysis  
Activity Diagram  
PERT/CPM  
Roadmaps  
Project Charter  
Gantt Chart  
Control Planning  
Gap Analysis  
How-How Diagram  
Standard work  
Simulation  
TPM  
Mistake Proofing  
Pull Systems  
JIT  
Ergonomics  
Work Balancing  
Automation  
Bottleneck Analysis  
Visual Management  
Flow  
Value Analysis  
Wastes Analysis  
SMED  
Time Value Map  
Process Redesign  
IDEF0  
Value Stream Mapping  
SIPOC  
Flow Process Chart  
Process Mapping  
Flowcharting  
Service Blueprints

**Understanding Performance**

Lean Measures  
OEE  
MSA  
Cost of Quality  
Reliability Analysis  
Benchmarking  
Focus groups  
Photography  
Measles Charts  
Data Collection  
KPIs  
Capability Indices  
RTY  
Descriptive Statistics  
Graphical Analysis  
Control Charts  
Interviews  
Check Sheets  
Surveys  
Observations

**Understanding Cause & Effect**

Scatter Plot  
5 Whys  
Fishbone Diagram  
Brainstorming  
Nominal Group Technique  
Affinity Diagram  
Lateral Thinking

**Identifying & Implementing Solutions\*\*\***

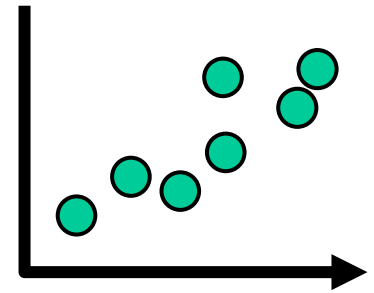
Tree Diagram\*\*  
Standard work  
Simulation  
TPM  
Mistake Proofing  
Pull Systems  
JIT  
Ergonomics  
Work Balancing  
Automation  
Bottleneck Analysis  
Visual Management  
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Process Redesign  
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Service Blueprints

**Creating Ideas\*\***

**Designing & Analyzing Processes**

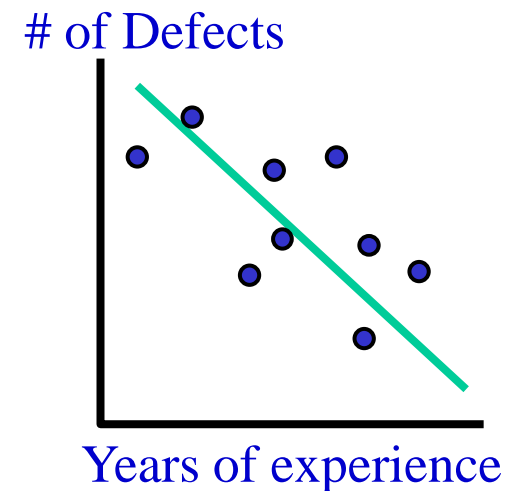
## - Scatter Plot

- ❑ Numerous problems encountered in quality require the estimation of relationships between two or more variables.
- ❑ A scatter diagram is a plot of two variables showing whether they are related.
- ❑ Used to study the relationship between variables.
- ❑ Used to determine what happens to one variable when another variable changes value.
- ❑ Used to verify the suspicion that a certain factor is causing a particular quality problem.



## - Scatter Plot

- ❑ Each point on the scatter diagram represents one data observation.  
One variable is represented along the X-axis while the other takes values along the Y-axis.
- ❑ For example, a manager may suspect that the number of defects are a function of the experience of the employees.
- ❑ After plotting the scatter diagram, any relationship between number of defects and the experience of employees should be clear.



# - Scatter Plot

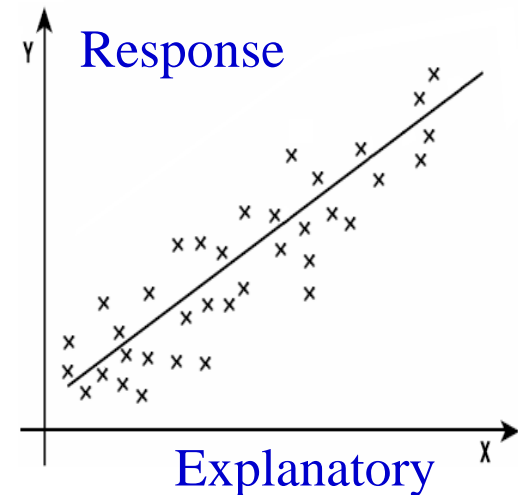
## Other Examples:

- ❑ The relationship between the height and the width of the man.
- ❑ The relation of the number of years of education someone has and that person's income.
- ❑ The relationship between the training frequency and the line efficiency.
- ❑ The relationship between the downtime of a machine and its cost of maintenance.



## - Scatter Plot

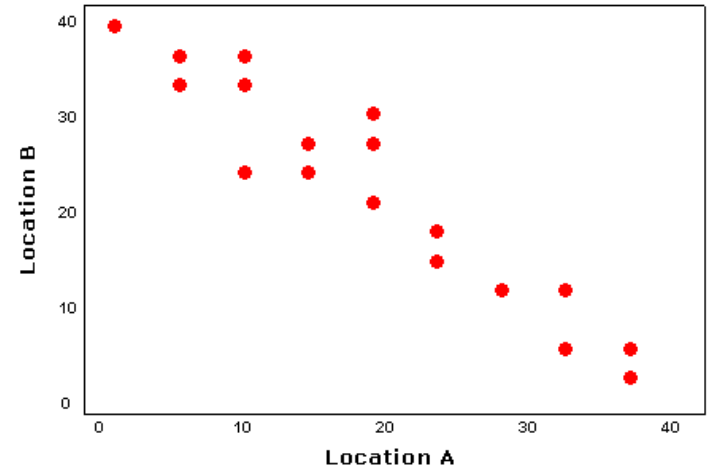
- ❑ We need to think about which variable is explaining the other.
- ❑ This will help determine which variable to plot on which axis.
- ❑ The value which explain the other called the **explanatory variable** which will be plotted on the x-axis.
- ❑ The other variable is called the **response variable**.



## - Scatter Plot

### Example:

- ❑ The amount of sales per month generated at two locations.
- ❑ The plotted points form a negative slope
- ❑ The sales at location B is inversely related to the sales at location A.
- ❑ Does this mean that location A caused the decrease in sales at location B, or vice versa?



**Answer:** Not necessarily - unless the two locations were direct competitors.

# - Scatter Plot

## The Process:

