

# Summary of Statistical Tools - Graphical

Tool	What	Type of Data	When to Use	Location in Minitab
Histogram	Visual display of one variable showing data center, spread, shape and outliers.	Continuous or discrete	<ol style="list-style-type: none"> <li>1. Summarize large amounts of data</li> <li>2. To get a 'feel for the data'</li> <li>3. To compare actual description to customer specs</li> </ol>	GRAPH > HISTOGRAM or STAT > BASIC STATISTICS > DISPLAY DESCRIPTIVE STATISTICS (under graph button)
Multivari Charts	Bar chart comparison of sub-groups on one variable.	Continuous or discrete	To visually compare sub-groups by individual data points and the mean. To identify major source of variation.	STAT > QUALITY TOOLS > MULTIVARI CHART
Box Plots	Visual display of the summary of Y data grouped by category of X.	Y=continuous X=discrete	Summary display to visualize differences in data center, spread and shape across categories.	GRAPH > BOXPLOT
Run Charts	Plots observation in time sequence	Y=continuous or discrete	To view process performance over time for trends, shifts or cycles.	STAT > QUALITY TOOLS > RUN CHART
Control Charts	Plots observations in time sequence against a mean and control limits.	Y=continuous or discrete	To monitor the process in order to control and improve process performance over time for trends, shifts or cycles. To identify special causes.	STAT > CONTROL CHARTS
Scatter Diagram (Plot)	Plots a response Y versus a predictor X.	Y=continuous X=continuous	To understand the possible relationships between two variables. To identify possible root causes which are related to Y	GRAPH > SCATTERPLOT
Pareto Chart	Plots an ordered bar chart of the response	Y = Continuous or discrete X=discrete	To identify major contributors	STAT > QUALITY TOOLS > PARETO

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Tool	What	Type of Data	When to Use	Location in Minitab
t-Test	Determine if there is a difference between two group means or if the mean of the data is equal to a standard value.	Y=continuous X=discrete	<ol style="list-style-type: none"> <li>1. Test if sample average = specified value</li> <li>2. Test if 2 sample means are equal</li> <li>3. Paired t: to reduce variation when comparing two sample averages</li> </ol>	STAT > BASIC STATISTICS > 1-SAMPLE t and STAT > BASIC STATISTICS > 2-SAMPLE t
F-test	Determine if there is a difference between two group variances	Y=continuous X=discrete	Determine if there is a statistically significant difference for the variances.	STAT > ANOVA > TEST FOR EQUAL VARIANCES
Analysis of Variance	Determine if there is a difference among many groups.	Y=continuous X=discrete (2 or more Xs)	Determine if there is a statistically significant difference among the groups.	STAT > ANOVA
X <sup>2</sup> Chi Square	Determine if there is a difference for observed frequencies of 1 or more discrete variables.	Y=discrete X=discrete	Determine if there are relationships between two discrete variables.	STAT > TABLES > CROSS TABULATION OR CHI-SQUARE
Regression (Linear & Multiple)	Summarizes, describes, predicts and quantifies relationships.	Y=continuous X=continuous or discrete	<ol style="list-style-type: none"> <li>1. Determine if there is evidence of a relationship between Xs and Ys.</li> <li>2. Model data to develop a mathematical equation to quantify the relationship.</li> <li>3. Identify root causes.</li> <li>4. Make predictions using the model.</li> </ol>	STAT > REGRESSION
Design of Experiments (DOE)	Systematic and efficient proactive approach to testing relationships.	Y=continuous or discrete X=continuous or discrete	To establish cause and effect relationship between Ys and Xs. To identify 'vital few' Xs.	STAT > DOE