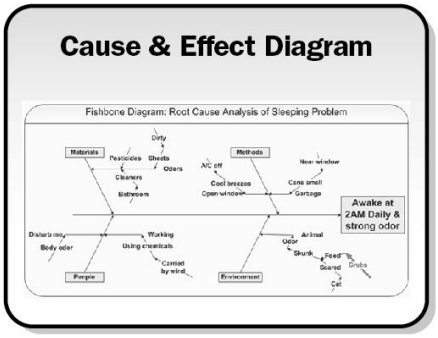
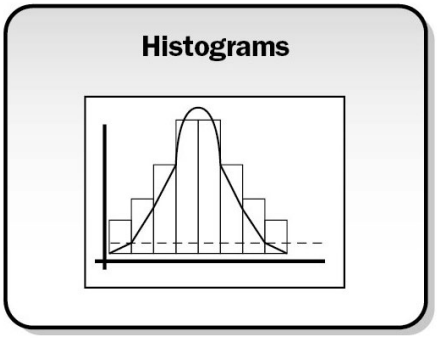
Control Quality: Tools and Techniques

Let's take a look at some of the tools and techniques in this process.

- [1] **Cause-and-effect diagrams** are also known as fishbone or Ishikawa diagrams, and may be written any of these ways on the exam. This diagram is used to get to the root cause of a problem, with the main problem being placed at the head of the fish. The question "why?" is asked until the root cause is found. Each fishbone may be a "cause" of the problem.



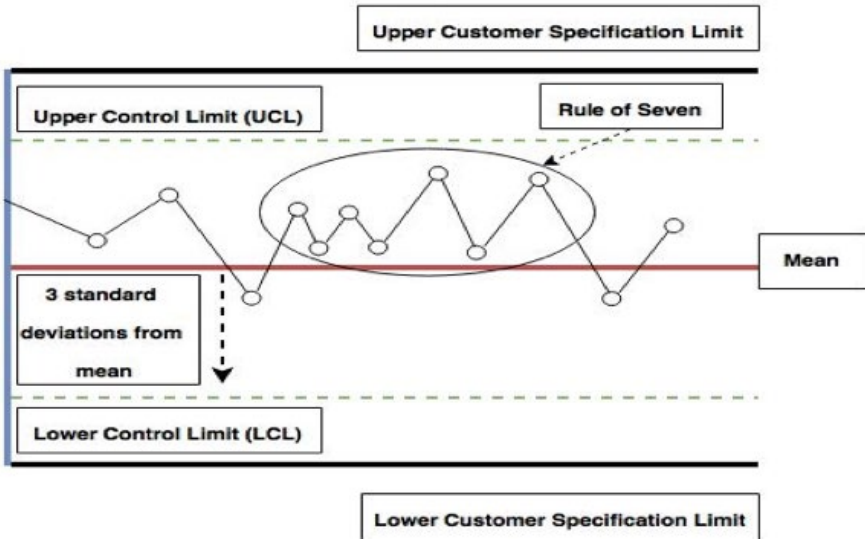
- [1] **Histograms** are bar charts that provide a visual representation of collected data. For example, a histogram may show multiple columns with the number of defects per month for a process.



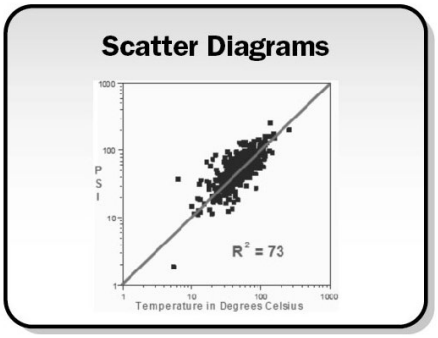
- **Control charts** are used to determine whether a process is in control. As seen in the graphic below, there are upper and lower customer specification limits. The customer states that if the product falls within these specifications, it's acceptable.
    - You'll also see that there is an upper (UCL) and lower (LCL) control limit. You always want to make sure you're in control of the process and your specifications fall within the customer's specifications; typically three standard deviations from the mean.
    - Each of the data points is plotted and checked to see if it's in specification. If not, the process needs to be investigated and corrected.
    - There's also a rule of thumb that if there are seven data points above or below the mean (called the rule of seven), then the process needs to be checked to see if it's going awry,

even though the data points are in specification. A normal distribution of data falls above and below the mean and not typically all above or below, so once you see seven in a row above or below the mean, the process needs to be checked.

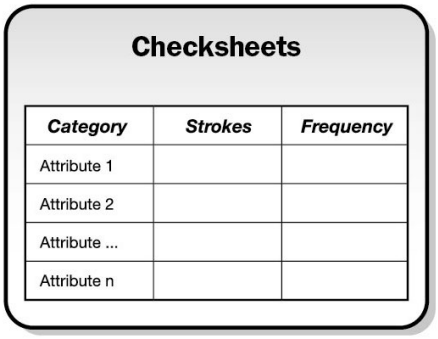
- Tip: This is a favorite question on the exam so be aware of the rule of seven.



- [1]**Scatter diagrams** are graphical and show the relationship between two variables.



- [1]**Checksheets** or tally sheets may be useful in gathering data. Checksheets are used to organize facts in a manner that will facilitate the effective collection of useful data about a potential quality problem. For example, you may tally every time a mistake happens in a process or you've identified a missing ingredient.



- Checklists provide a list of steps to be performed.

Travel Checklist	
Passport	☐
Sunscreen	☐
Money	☐
Camera	☐
Toiletries	☐

1 Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Fifth Edition, Project Management Institute, Inc., 2013, Figure 8-7, Page 239.

2These definitions are taken from the Glossary of Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute Inc., 2017.