

A systematic, rigorous approach to problem-solving that applies principles and techniques at the data collection stage so as to ensure the generation of valid, defensible, and supportable conclusions.

- Croarkin and Tobias

Framework for Success

Define the problem: Create a clear goal for the experiment

Select measure: Determine which measurement fits the goal the best that utilizes available resources

Brainstorm factors: Propose potential factors that may impact your measurement and how you plan to mitigate or investigate their effects

Make a plan: Select an experimental design that aligns with your factor management and investigation strategy

Measure carefully: Conduct your experiment according to your execution plan

Analysis and conclusion: Interpret your results with proper context

Key Terms

Randomization

Reduces potential bias by equalizing the impact of factors that are not explicitly controlled for in the experimental design.

Blocking

Reduces variability by grouping test samples on common characteristics, often used to accommodate factors that are too difficult or costly to randomize.

Factors

Variables that can influence the outcome of the variable of interest. Factors can come in many shapes and sizes including treatment factors or nuisance factors.

Things to Remember

Take your time, rushing steps create problems that become harder and harder to accommodate.

Revisit each step briefly as you continue, ensure that any changes you made along the way align with your original objective and revise as needed.