Table 1.1 A Six-Step Process-Oriented Quality Assurance Cycle (and Corresponding Tools)

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<th>Step</th>
<th>Tools</th>
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| 1. Attempt a logical analysis of how a process works (or should work) and where potential trouble spots, sources of variation, and data needs are located. | • Flowcharts (§2.1)  
• Ishikawa/fishbone/cause-and-effect diagrams (§2.1) |
| 2. Formulate appropriate (customer-oriented) measures of process performance and develop corresponding measurement systems. | • Basic concepts of measurement/metrology (§2.2)  
• Gage repeatability and reproducibility studies (§2.2) |
| 3. Habitually collect and summarize process data. | • Simple quality assurance data collection principles (§2.3)  
• Simple statistical graphics (§2.4)  
• Control charts (Ch. 3, Ch. 4) |
| 4. Assess and work toward process stability. | • Statistical graphics for process characterization (§5.1)  
• Measures of process capability and performance and their estimation (§5.2, §5.3)  
• Probabilistic tolerancing and propagation of error (§5.4)  
• Estimation of variance components (§5.5) |
| 5. Characterize current process and product performance. | • Design and analysis of experiments (Ch. 6, Ch. 7) |