



**Objectives Sheet**  
**CMQ 142 - Basic Measuring**

*Course Learning/Performance Objectives followed by enabling learning objectives*

<b>CMQ 142.U01.01</b>	<b>Identify the importance of dimensional measurement in Quality Assurance.</b>
CMQ 142.U01.01.01	Identify standards in measurement.
CMQ 142.U01.01.02	Identify the requirements for tool traceability in measurement.
CMQ 142.U01.01.03	Define gaging and measuring.
CMQ 142.U01.01.04	Identify QAS role in gaging and inspection.
<b>CMQ 142.U01.02</b>	<b>Given measurement standards, recognize the considerations taken to acquire precise measurements.</b>
CMQ 142.U01.02.01	Recognize accuracy, precision, repeatability, and reproducibility in measurement.
CMQ 142.U01.02.02	Recognize the variables that affect the accuracy of measurements.
CMQ 142.U01.02.03	Identify the role of calibration in measurement.
CMQ 142.U01.02.04	Identify calibration methods and techniques.
CMQ 142.U01.02.05	Identify each type of calibration system.
CMQ 142.U01.02.06	Identify correct calibration intervals.
CMQ 142.U01.02.07	Indicate the characteristics of an optimal calibration environment.
CMQ 142.U01.02.08	Identify the role of sensitivity in measurement.
CMQ 142.U01.02.09	Identify the reference surface.
CMQ 142.U01.02.10	Identify the measured surface.
CMQ 142.U01.02.11	Identify general guidelines for handling measurement tools safely.
CMQ 142.U01.02.12	Identify general guidelines for caring for measurement tools.
<b>CMQ 142.U01.03</b>	<b>Given a scenario involving measurements, demonstrate the use of truncation, rounding, and conversion rules.</b>
CMQ 142.U01.03.01	Apply truncation rules for positive and negative numbers.
CMQ 142.U01.03.02	Apply rounding rules for positive and negative numbers.
CMQ 142.U01.03.03	Apply the measurement conversion procedure for metric and English units.
<b>CMQ 142.U02.01</b>	<b>Recognize the appropriate situation for using hand tools.</b>
CMQ 142.U02.01.01	Identify the types and uses for steel rules.
CMQ 142.U02.01.02	Identify the types and uses for protractors.
CMQ 142.U02.01.03	Identify the types and uses for calipers.
CMQ 142.U02.01.04	Identify the types and uses for micrometers.
CMQ 142.U02.01.05	Identify the types and uses for tapered parallels.
CMQ 142.U02.01.06	Identify the types and uses for surface plates.
CMQ 142.U02.01.07	Identify the types and uses for surface plate gages.
CMQ 142.U02.01.08	Identify the types and uses for gage blocks.
CMQ 142.U02.01.09	Identify the types and uses for gage pins.
CMQ 142.U02.01.10	Identify the types and uses for feeler gages.
CMQ 142.U02.01.11	Identify the types and uses for dial depth gages.
<b>CMQ 142.U03.01</b>	<b>Recognize the appropriate situation for using hand tools for measuring circularity.</b>
CMQ 142.U03.01.01	Identify the types and uses for bore gages.
CMQ 142.U03.01.02	Identify the types and uses for radius gages.
CMQ 142.U03.01.03	Identify the types and uses for small hole gages.
CMQ 142.U03.01.04	Identify the types and uses for telescoping gages.
<b>CMQ 142.U04.01</b>	<b>Recognize the appropriate situation for using go or no-go hand tools.</b>
CMQ 142.U04.01.01	Define attribute gages.
CMQ 142.U04.01.02	Identify the types and uses for plug gages.
CMQ 142.U04.01.03	Identify the types and uses for ring gages.
<b>CMQ 142.U05.01</b>	<b>Recognize the appropriate situation for using equipment for uncommon measuring conditions.</b>
CMQ 142.U05.01.01	Identify the types and uses for surface finish measurement tools.
CMQ 142.U05.01.02	Identify the types and uses for torque wrenches.



# Objectives Sheet

## CMQ 142 - Basic Measuring

*Course Learning/Performance Objectives followed by enabling learning objectives*

<b>CMQ 142.U06.01</b>	<b>Recognize how to use a mechanical comparator to take a measurement.</b>
CMQ 142.U06.01.01	Identify the types and uses for mechanical comparators.
CMQ 142.U06.01.02	Recognize the procedure for using mechanical comparators.
<b>CMQ 142.U06.02</b>	<b>Recognize how to use a cable tension meter to take a measurement.</b>
CMQ 142.U06.02.01	Identify the types and uses for cable tension meters.
CMQ 142.U06.02.02	Recognize the procedure for using cable tension meters.
<b>CMQ 142.U06.03</b>	<b>Recognize how to use the three-wire method to take a measurement.</b>
CMQ 142.U06.03.01	Identify the uses for the three-wire method.
CMQ 142.U06.03.02	Recognize the procedure for using the three-wire method.
<b>CMQ 142.U06.04</b>	<b>Recognize how to use a thread gage to take a measurement.</b>
CMQ 142.U06.04.01	Identify the types and uses for thread gages.
CMQ 142.U06.04.02	Recognize the procedure for using thread gages.
<b>CMQ 142.U06.05</b>	<b>Recognize how to use a centerline gage to take a measurement.</b>
CMQ 142.U06.05.01	Identify the types and uses for centerline gages.
CMQ 142.U06.05.02	Recognize the procedure for using centerline gages.
<b>CMQ 142.U06.06</b>	<b>Recognize how to use a snap gage to take a measurement.</b>
CMQ 142.U06.06.01	Identify the types and uses for snap gages.
CMQ 142.U06.06.02	Recognize the procedure for using snap gages.
<b>CMQ 142.U06.07</b>	<b>Recognize how to use a pneumatic comparator to take a measurement.</b>
CMQ 142.U06.07.01	Identify the types and uses for pneumatic comparators.
CMQ 142.U06.07.02	Recognize the procedure for using pneumatic comparators.
<b>CMQ 142.U06.08</b>	<b>Recognize how to use an optical comparator to take a measurement.</b>
CMQ 142.U06.08.01	Identify the types and uses for optical comparators.
CMQ 142.U06.08.02	Recognize the procedure for using optical comparators.
<b>CMQ 142.U06.09</b>	<b>Recognize how to use a coordinate measuring machine to take a measurement.</b>
CMQ 142.U06.09.01	Identify the types and uses for Coordinate Measuring Machines (CMMs).
CMQ 142.U06.09.02	Recognize the procedure for using CMMs.
<b>CMQ 142.U06.10</b>	<b>Recognize how to use a durometer to take a measurement.</b>
CMQ 142.U06.10.01	Identify the types and uses for a durometer.
CMQ 142.U06.10.02	Recognize the procedure for using durometers.
CMQ 142.U06.10.03	Recognize the procedure for Brinell Hardness Testing.
CMQ 142.U06.10.04	Recognize the procedure for Rockwell Hardness Testing.
<b>CMQ 142.U07.01</b>	<b>Given a description of a measurement activity, identify the types of measurement errors.</b>
CMQ 142.U07.01.01	Recognize an observational measurement error.
CMQ 142.U07.01.02	Recognize a manipulative measurement error.
CMQ 142.U07.01.03	Recognize a bias measurement error.
CMQ 142.U07.01.04	Recognize gage errors.
CMQ 142.U07.01.05	Recognize a part measurement error.
<b>CMQ 142.U07.02</b>	<b>Given a scenario describing measuring conditions, select the best-suited measurement tool.</b>
CMQ 142.U07.02.01	Select a measurement tool based on the 10-to-1 rule.
CMQ 142.U07.02.02	Indicate the considerations taken when choosing a measurement tool.