

# Unit 1: Measurement in 1/64th to 1/100 th of an Inch with measurement tools

Content Area: **Industrial Technology**  
Course(s): **Manufacturing Tech III/ IV**  
Time Period: **1 marking period**  
Length: **2 Weeks**  
Status: **Published**

## Unit Overview

---

Measurement in 1/16th to 1/100th of an inch.

## Transfer

---

Students will be able to independently use their learning to...

Students will be able to apply measurement skills in manufacturing of their independent individual projects and use the skills later in life for quality control job positions.

---

For more information, read the following article by Grant Wiggins.

[http://www.authenticeducation.org/ae\\_bigideas/article.lasso?artid=60](http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60)

## Meaning

---

Students will use these skills in Measurement for Projects and later in life for quality control jobs.

## Understandings

---

Students will understand that...

Identify basic measuring tools and gages and explain how they are used.

Measure to 1/64" and 0.5 mm with a steel rule.

Make measurements to 0.001" and 0.01 mm with a micrometer caliper.

Use a Vernier micrometer caliper to read measurements to 0.0001" and 0-002 mm.

Explain how to make readings with common Vernier measuring tools.

Recognize different types of gages and demonstrate how they are used to check sizes.

-What inferences should they make/grasp/realize?

The various types of rules.

How to read the various types of rules.

How to make accurate measurements with a rule.

How to handle and care for rules so they will retain their accuracy

## **Essential Questions**

---

Students will keep considering...

How will this information on measurement be used in class?

How will this information benefit me as a job skill in my future?

What are these skills used on in industry?

## **Application of Knowledge and Skill**

---

**Students will know...**

---

Students will know...

What facts and basic concepts should students know and be able to recall?

### **Students will be skilled at...**

---

Students will be skilled at...

What discrete skills and processes should students be able to use?

Reading a steel rule.

Reading and taking measurements using a Vernier Caliper.

Reading and taking measurements using a Micrometer.

### **Academic Vocabulary**

---

dial calipers

gage blocks

graduations

International System of Units

micrometer

plug gage

ring gage

steel rule

Vernier caliper

Vernier scale

### **Learning Goal 1**

---

Reading the steel rule in 1/32th, 1/64th, 1/100th of an inch to measure individual projects during layout.

- Reading the steel rule in 1/32th, 1/64th, 1/100th of an inch to measure individual projects during layout.
- |                 |   |
|-----------------|---|
| 12.9.3.MN.6     | Demonstrate workplace knowledge and skills common to manufacturing. |
| 12.9.3.MN-HSE.1 | Demonstrate the safe use of manufacturing equipment.                |
| 12.9.3.MN-QA.1  | Evaluate production operations for product and process quality.     |

## **Target 1**

---

Reading the Rule (US Conventional Measure)

Reading the Rule (SI Metric Measure)

Care of the Rule

- Care of the Rule
- Reading the Rule (US Conventional Measure)
- Reading the Rule (US Conventional Measure)

## **Learning Goal 2**

---

The Micrometer Caliper will be used to measure individual projects in 1/100th of an inch.

- |                 |  |
|-----------------|--|
| 12.9.3.MN.4     | Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways. |
| 12.9.3.MN.5     | Describe government policies and industry standards that apply to manufacturing.                                     |
| 12.9.3.MN-HSE.1 | Demonstrate the safe use of manufacturing equipment.   |
| 12.9.3.MN-MIR.4 | Investigate and employ techniques to maximize manufacturing equipment performance.                                   |
| 12.9.3.MN-QA.4  | Employ project management processes using data and tools to deliver quality, value-added products.                   |

## **Target 1**

---

Identify the different types of Micrometers.

Identify an outside micrometer and measure external diameters and thicknesses.

Identify an inside micrometer and measure internal diameters of cylinders and rings.

Read an Inch Based Micrometer.

## **Learning Goal 3**

---

SWBAT read the dial calipers in 1/100th of an inch to measure outside diameter, inside diameter and depth on

individual projects.

12.9.3.MN.1	Evaluate the nature and scope of the Manufacturing Career Cluster and the role of manufacturing in society and in the economy.
12.9.3.MN.4	Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways.
12.9.3.MN.6	Demonstrate workplace knowledge and skills common to manufacturing.
12.9.3.MN-HSE.3	Demonstrate a safety inspection process to assure a healthy and safe manufacturing environment.
12.9.3.MN-QA.7	Identify inspection processes that ensure products meet quality specifications.

### **Target 1**

---

SWBAT identify parts of the dial caliper and safely handle them to avoid damage. Then accurately take a measurements of the out side diameter of an object.

### **Target 2**

---

Students will be able to read the dial and state the measurement they have with the calipers.

### **Target 3**

---

Students will be able to measure the inside diameter and depth of an object with the dial caliper and then apply these skills to their individual project.

### **Summative Assessment**

---

Based on written Test on diagrams of measurements.

### **21st Century Life and Careers**

---

CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.

### **Formative Assessment and Performance Opportunities**

---

Students will be able to use skills to measure parts when constructing projects and drill bits.

### **Accommodations/Modifications**

---

SWBAT research job and career related occupations that use precision measurements.

### **Unit Resources**

---

Chapter 5 Modern Metal Working pages:69-96

Chapter 5 Modern Metal Working Workbook pages:29-38

You tube videos on precision measurement and its applications