

Student Name:

Points 10

Period: _____

Date:

Activity 3.1.a

Due: _____

Linear Measurement with the International System of Units

INTRODUCTION

Modern civilization cannot exist without measurement systems. Measurements are everywhere, and you use them every day. Every time you buy gas, check the outside temperature, or step on a weight scale, measurements are used to represent a quantity. The abilities to conduct, record, and convert measurements are necessary to understand our technological world and to carry on the business of living. The fields of science, engineering, and mathematics use measurements extensively in the processes of discovery and design.

An interesting aspect of measurement is that a single quantity can be **measured** in different ways. One may describe the height of a horse in hands, feet, or meters. One can give the length of a property line in chains, miles, or meters. The **units** commonly used to measure a quantity can change with time and across borders. In the past it was not necessary to understand the system of measurement used by people outside of your local area, but today the world is a global marketplace.











The United States is the only developed country that has not fully adopted the **International System of Units**. To participate in the global market, we must be able to understand and communicate using various measurement systems. An object that is designed in the United States may end up being manufactured in another country. Due to the global nature of technology, engineered objects must often be communicated in SI (modern metric) units.

Within the science, engineering, and mathematical communities, **accuracy** and **precision** of measurements is extremely important. Often the correctness of a measurement is critical to the work of scientists, engineers, and mathematicians and must be carefully considered.

In this activity you will practice taking linear using SI measurements with a metric ruler and correctly recording the measurements to reflect the precision of the measurement.

Procedure-Log into PLTW

- Record the length of each rectangle in both fractional inch and decimal inch forms. Record fractional inches to the nearest $\frac{1}{32}$ of an inch, and record decimal inches to the nearest hundredth of an inch.


Distance	Measurement (Fraction)	Measurement (Decimal)
A		
B		
C		
D		
E		

- What is the difference in length between rectangles A and C?

















- What is the difference in length between rectangles B and E?

4. Using a ruler displaying U.S. Customary units, measure the missing lengths on the **Activity 3.1b Answer Sheet**. In the top half of each box, enter the **dimension** in fractional inches to appropriate precision (nearest $1/32''$). Then **convert** the length to decimal inches and enter the result into the bottom half of the corresponding box to the nearest hundredth of an inch. Be sure to include units. Note that \varnothing indicates a diameter, and R indicates a radius.
5. Measure the distance between two lines next to each other on a sheet of lined paper in U.S. Customary units. Record the measurements using each of the following units.

Fractional inches: 

Decimal inches: 

6. Measure and record the length of additional items in your classroom using appropriate measurement units as directed by your instructor. Record fractional inches to the nearest $1/32''$ and decimal inches to the nearest $1/100''$.

Object	Description of measurement	Measurement units	Measurement
CD	Diameter	cm	
Desk	Length and width	Decimal inches	
			
			
			

7. In your PLTW Engineering Notebook, create a full-scale isometric view of the object represented in the following sketch using the dimensions shown. Use a ruler to obtain the correct dimensions on your sketch.

CONCLUSION