



# Metric Measurement

Using the International  
System of Units

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# Measuring

- What is Measuring?
  - Finding the size, dimensions, capacity, duration, or quantity of an object or an event with a specialized tool.

# Measuring

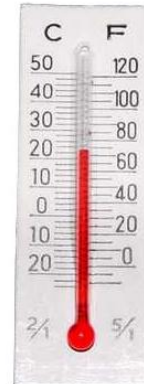
- Why do we measure?
  - To understand objects.
  - To compare objects.
  - To standardize.

# Measuring

- How do we measure?
- With specialized tools.
- We use a system of measurement.

## Metric System

Kilometer, liter, gram,  
°C, Second



## English System

Pound, Foot, Quart,  
Second, °F



# The International System of Units (SI)

## DID YOU KNOW?

Since 1960, the modern version of the metric system has been the **International System of Units**, or **SI** (from the French "Système international d'unités"). The original metric system was developed in France during the 1790s, but it didn't exactly take off in other places. Countries kept their own unique systems of weights and measures because it was easier than converting to a new system, even one that made more sense.

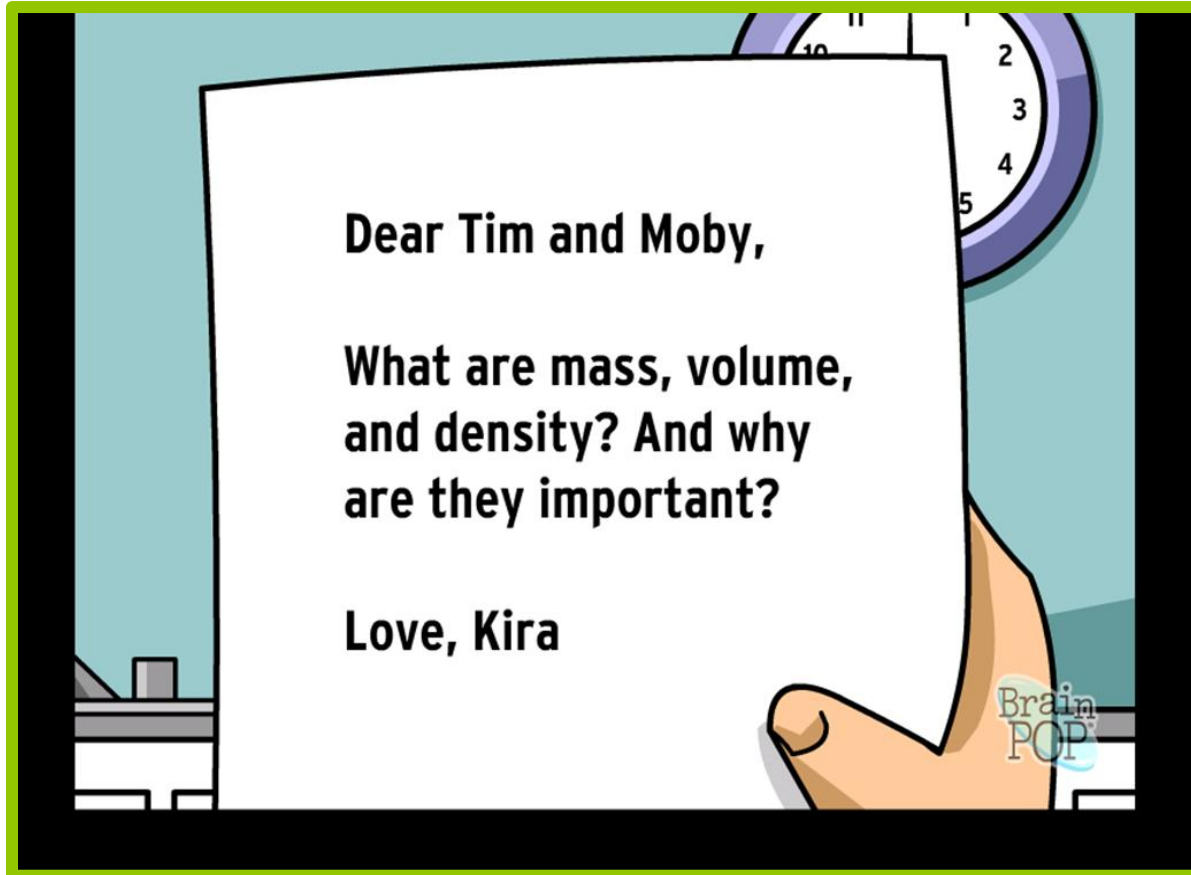
By the middle of the 20th century, there were tons of different systems in use around the world. Then in 1960, the 11th General Conference on Weights and Measures settled on a system of six basic units, building on the existing metric measures for length (meter) and mass (kilogram). They were:

- **Meter** (distance)
- **Kilogram** (mass)
- **Second** (time)
- **Ampere** (electric current)
- **Kelvin** (temperature)
- **Candela** (brightness)

A seventh unit, the **mole**, which measures how much of a substance there is on a molecular level, was added in 1970. Most countries quickly adopted the International System of Units, and it's now the standard measurement system in every country in the world except for the United States, Myanmar (Burma), and Liberia.



# Measuring



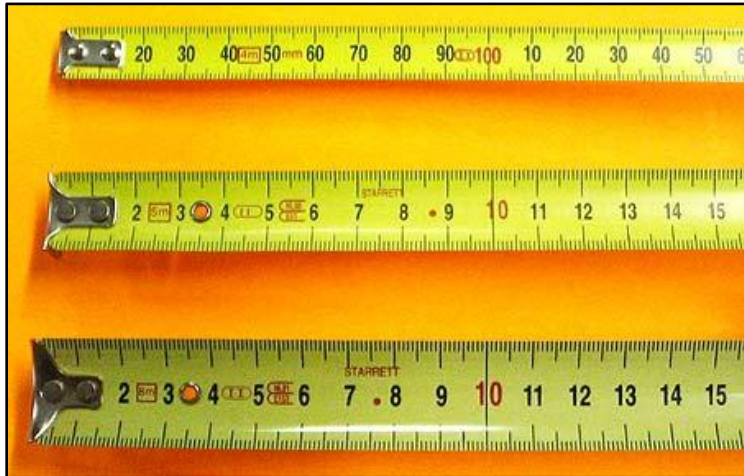
# Length/Distance

- Calculating the depth, height, or length of an object, or the distance between locations.
- SI Unit & Base Unit: Meter
- Symbol: m
- Other Metric Units:

Common Metric Length/Distance Units	Unit Symbol	Conversions
millimeter	mm	1000 mm = 1 m
centimeter	cm	100 cm = 1 m
kilometer	km	1 km = 1000 m

# Length/Distance

- Tools:



Metric Tape Measure



Metric Ruler



Meter Stick

# Volume

- Amount of space an object takes up.  
(aka...Capacity – how much a container will hold.)
- SI Unit & Base Unit: Liter
- Symbol: L
- Other Metric Units:

Common Metric Volume Units	Unit Symbol	Conversions
milliliter	mL	1000 mL = 1 L
kiloliter	kL	1 kL = 1000 L

# Volume

- Tools:



Graduated Cylinders



Metric Measuring Cup



Beakers

# Mass

- Amount of matter in an object.
- SI Unit: Kilogram (Base Unit: Gram)
- Symbol: kg (g)
- Other Metric Units:

Common Metric Mass Units	Unit Symbol	Conversions
Milligram	mg	1000 mg = 1 g
Kilogram	kg	1 kg = 1000 g

# Mass

- Tools:



Electronic Balance



Spring Scale



Triple Beam Balance

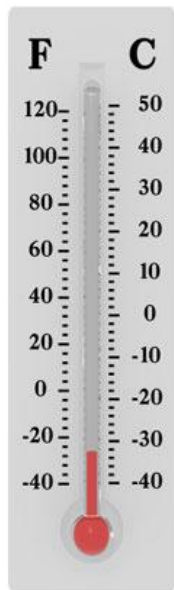
# Temperature

- The warmth or coldness of an object.
- SI Unit: Kelvin (degrees Celsius)
- Symbol: K ( $^{\circ}\text{C}$ )
- Other Metric Units:

Common Metric Temperature Units	Unit Symbol	Conversions
Kelvin	K	$0^{\circ}\text{C} = 273 \text{ K}$
Degrees Celsius	$^{\circ}\text{C}$	$100^{\circ}\text{C} = 373 \text{ K}$

# Temperature

- Tools:



Thermometer

# Time

- Duration of an event.
- SI Unit: Second
- Symbol: s or sec
- Other Metric Units:

Common Metric Time Units	Unit Symbol	Conversions
millisecond	s	1 s = 1000 ms
Minute	Min	1 min = 60 s

# Time

- Tools:



Stop Watch



Clock



Calendar