

# Starter Question

Day 1:

- Use your book to fill in vocabulary words #1 and #2 in your packet.
- On your starter page write down 2 reasons why it would be important to be able to measure things.

Why is it important to measure things?

# How do we measure things?

- In science we use the **metric system**.
  - A measuring system of standards that is used by every scientist.

- Why is it important for scientists to have a common way of measuring?
- What would the world be like if we didn't have a common ground for communication?

# An Example

- <https://www.youtube.com/watch?v=0MUsVcYhERY>

# Units

- What is a unit?
  - Examples: meter, gram, etc.
  - Standards of measurement that never change
  - These units stay the same and so they can be used for comparison

# Collecting Data

- What tools do scientists use to collect numerical data?

# Because of Technology, we use many different instruments to collect Data /

## Evidence

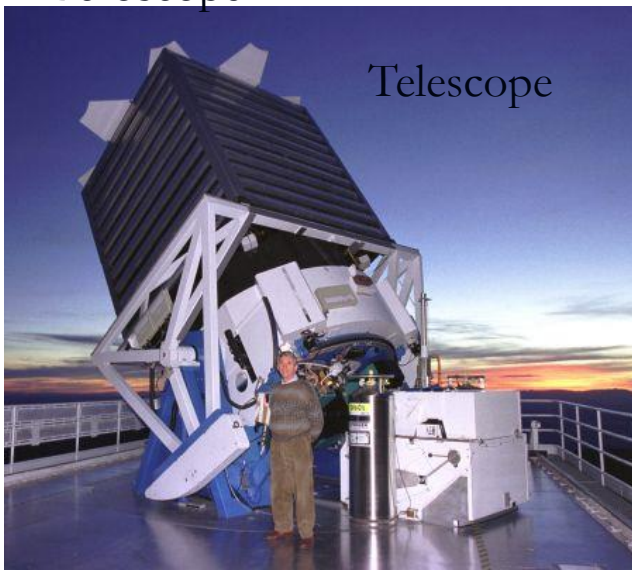
Radar

Carbon Monoxide Detectors



Microscope

Telescope



GPS





# Metric System

<b>Measures</b> [Variable]	<b>Instrument</b>	<b>Unit</b>

# The Main Unit for length

- Length: measures how long something is.
- Meter Stick
- Meter [m]



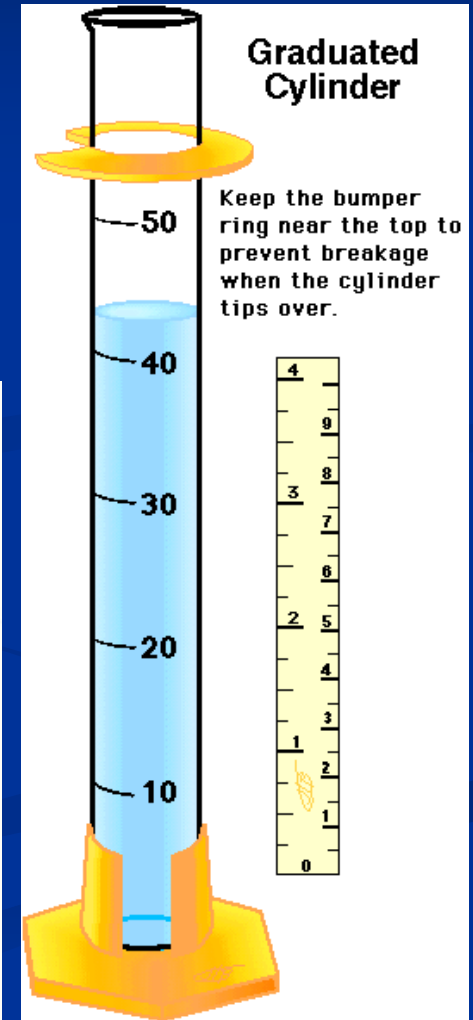
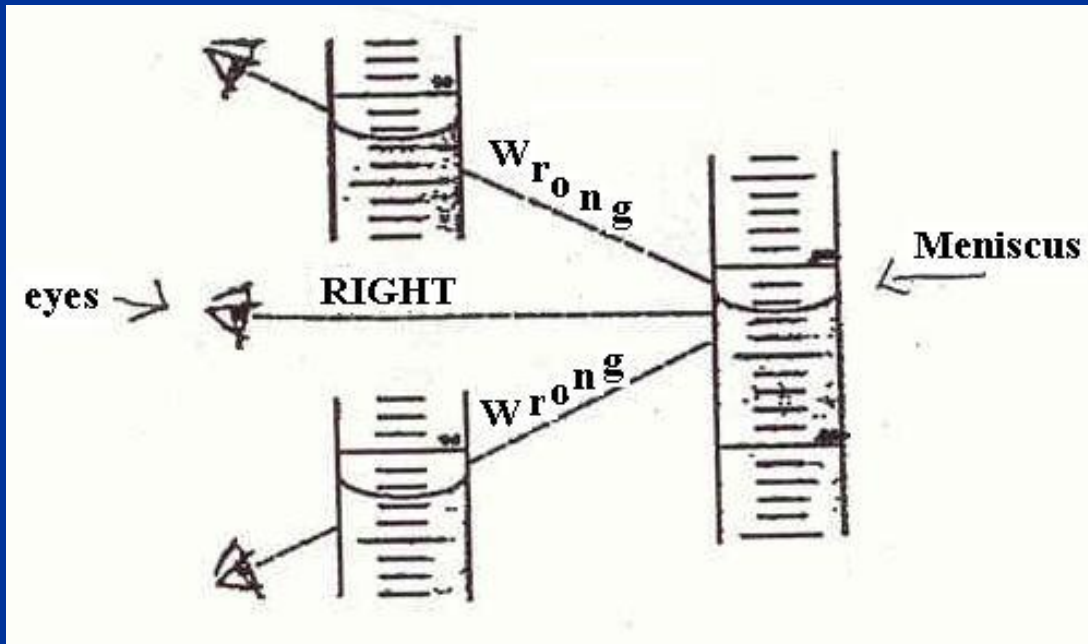
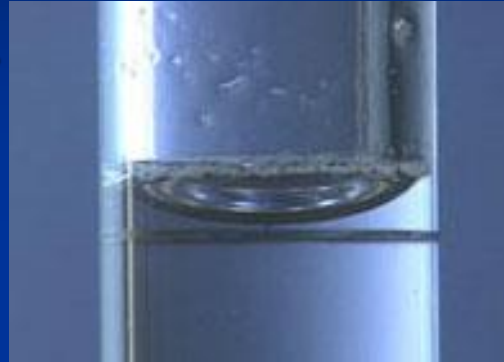
# The Main Unit for Mass:

- Mass: how much matter something has (how much *stuff* something has)
  - Matter: anything that has mass and takes up space.
- Balance
- Gram [g]



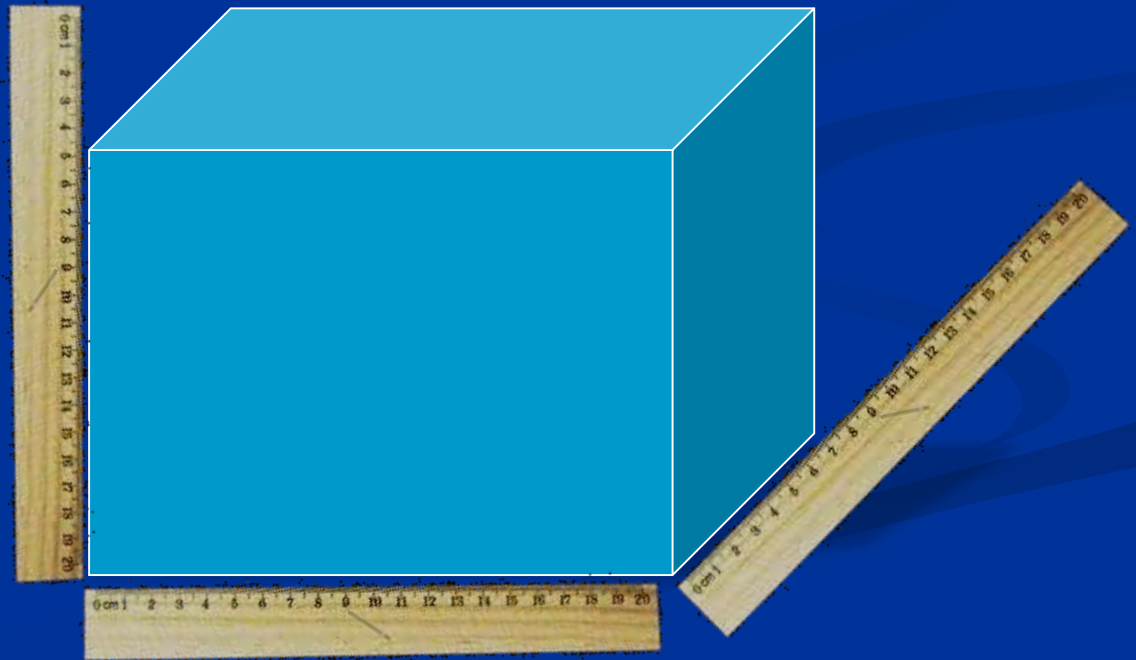
# The Main Unit for volume

- Volume: How much space the object occupies
- Graduated Cylinder
- Liter [L]
  - $1 \text{ mL} = 1 \text{ cm}^3$



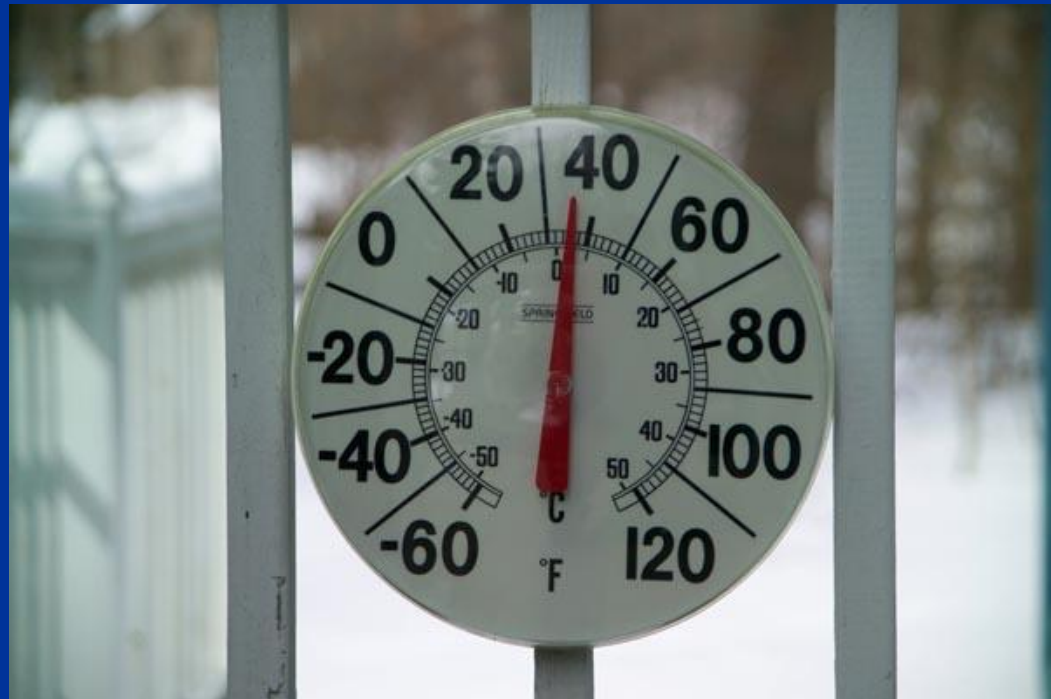
# The Main Unit for volume

- Volume: How much space the object occupies
- Ruler used in 3 Dimensions (3D)
- Cubic Centimeters [ $\text{cm}^3$ ]
  - $1\text{cm}^3 = 1\text{ mL}$



# The Main Unit for temperature

- Temperature: Measures how hot something is.
- Thermometer
- Celsius [ $^{\circ}\text{C}$ ] – (Metric Unit)



# Metric System

Measures	Instrument	Unit
Length	Ruler/Meter Stick	[m] Meters
Mass	Balance Beam	[g] Grams
Volume	Graduated Cylinder	[L] Liters
	Ruler 3D	[cm <sup>3</sup> ] Cubic Centimeters
Temp.	Thermometer	[°C] Celsius

# Measurement Point

- Always use DECIMALS – NEVER FRACTIONS!



# Conversions

How to convert from one metric unit to the next.

## Prefix + Main Unit

(Kilo, Centi, Milli) + (Meter (m), Liter (l), Gram (g) )

- 1 Kilo (k) (= 1000 main units)
- 1 Centi (c) (=  $1/100^{\text{th}}$  of a main unit)
- 1 Milli (m) (=  $1/1000^{\text{th}}$  of a main unit)

# Metric Conversions

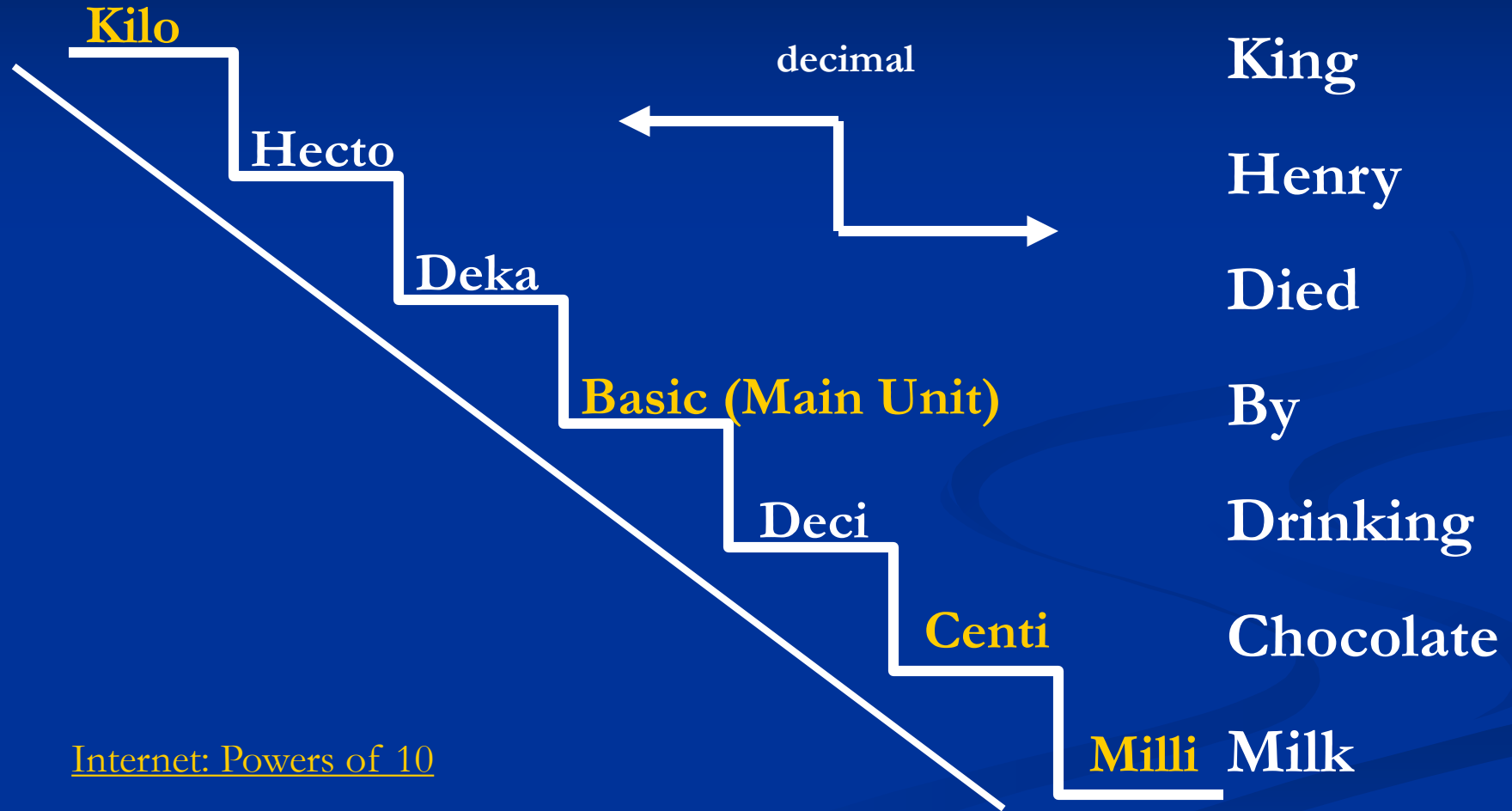
Since the metric system is based on the number 10, to convert, you use the proper prefix and either multiply or divide the main unit by factors of 10. i.e. 10, 100, 1000 etc.

Main Unit	Centi: Divide by 100	Milli: Divide by 1000	Kilo: Multiply by 1000
1 Meter [m]	1 Centi-meter [cm]	1 Milli-meter [mm]	1 Kilo-meter [Km]
1 Liter [L]		1 Milli-Liter [mL]	
1 Gram [g]			1 Kilo-gram [Kg]

What that means is, you've just changed the whole standard by which you based your measurement by. That means ...

Main Unit	It takes 100 Centi-units make one main unit	It takes 1000 Milli-units to make one main unit	It takes 1000 main units to make one Kilo Units!
1 Meter [m]	1 Centi-meter [cm]	1 Milli-meter [mm]	1 Kilo-meter [Km]
1 Liter [L]		1 Milli-Liter [mL]	
1 Gram [g]			1 Kilo-gram [Kg]

# Conversion Chart



[Internet: Powers of 10](#)

# Do Mass, Length, Volume Lab

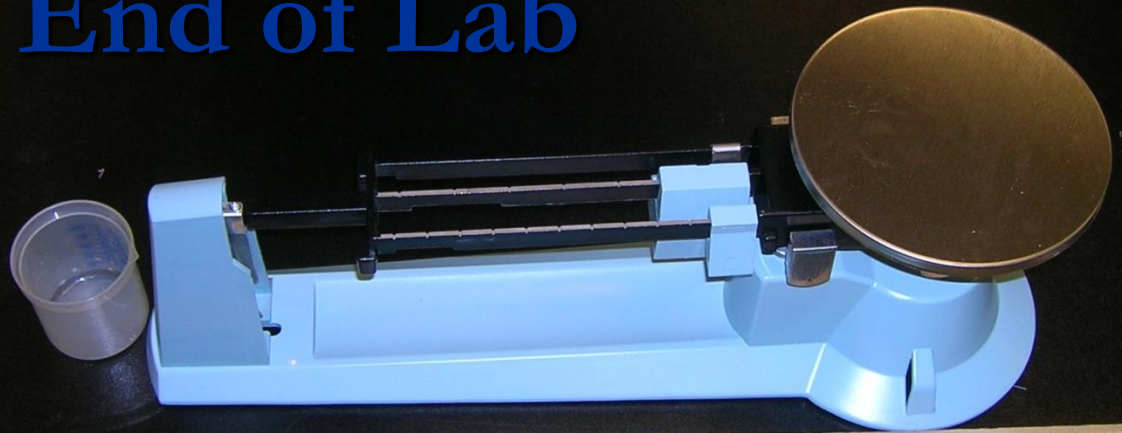
# What should you do if you have a question about the lab?

- A) Just make it up, it will be fine whatever you do
- B) Yell for the teacher to come over
- C) Skip it, who needs it anyway?
- D) Talk to your group and if you still can't figure it out, raise your hand and patiently wait for the teacher to come over.

# During Lab

- Work together and stay with your group.
- Collect your data first.
- Work on your questions last.
  - Remember, no horse play.

# End of Lab



- Put all lab equipment back in their proper place.



If you finish the lab early...

- Double check your work. Make sure you did everything correctly.
- Continue working on your vocabulary in your packet.



# End of Period

- Put your seats under the desks



# Lab Activity

- Lab: Mass, Length, Volume
  - Timer