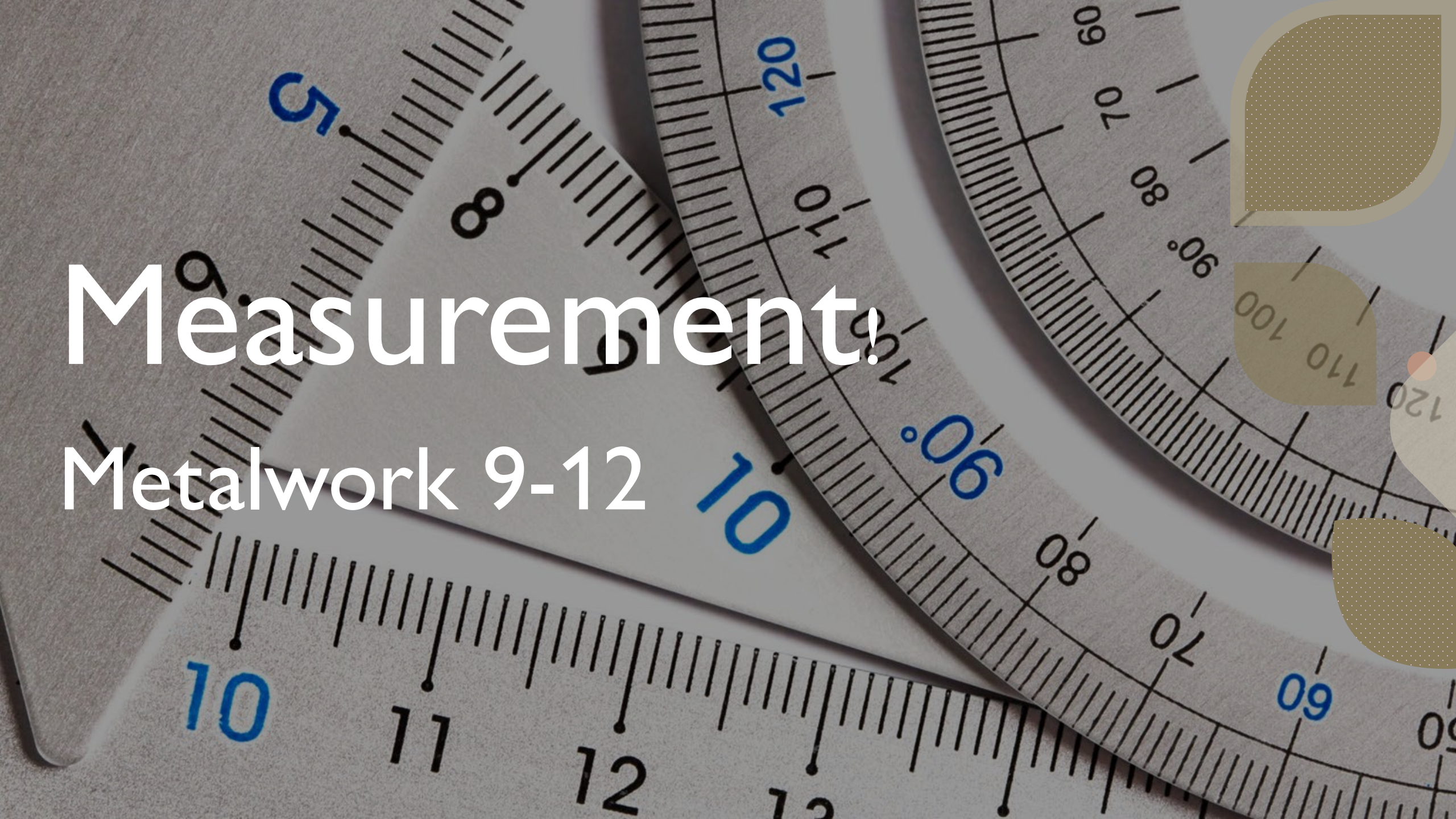


# Measurement!

Metalwork 9-12

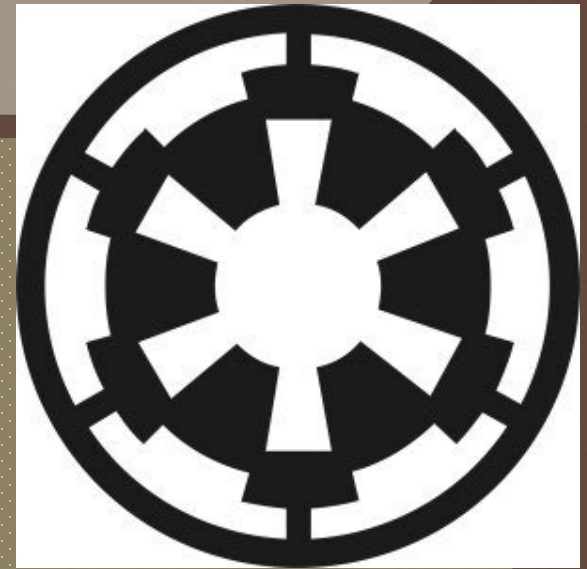


# Worldwide systems of Measurement

- Imperial Vs Metric

## **Imperial System**

- First defined by the British in the 1800's
- Lengths: mile, yard, foot, inch
- Canada continues to use the Imperial System when trading with goods with the USA



The Galactic Empires  
Imperial symbol

# 1 Foot ruler

- The ruler represents a length of 1 foot (not actual size).
- Each of the numbers on the ruler represents a length of 1 inch. Count each inch marker.
- Note: there are 12 inches in 1 foot - you need to remember this when measuring with imperial measurement.



# Not all feet are the same

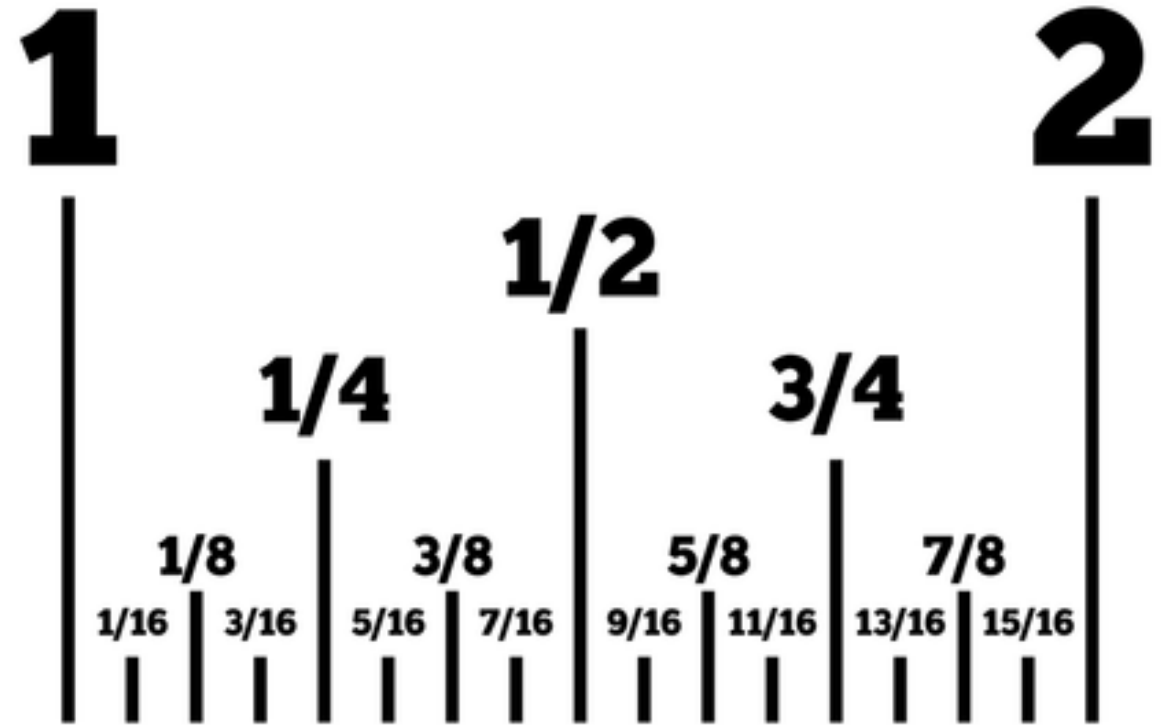
- Measuring distance could be done by stepping if we all had the same size feet
- Shoe companies wouldn't be able to make such huge profits if we all had the same size feet
- Footprints in the pacific northwest would run the risk of being misidentified if we all humanoid/primate creatures had the same size feet



# One inch (not actual size)

- This Inch is divided into 16 equal parts.
- Each tick (vertical stroke) represents one sixteenth of an inch -  $1/16''$
- Count the ticks to determine the number of **sixteenths** at various points along the inch

**Note:** the fractions have been "simplified" if required



# Measuring in Feet and Inches

To be able to successfully measure in feet and inches you need to know your **twelve times** table. The imperial measurement system uses fractions.

You will NOT be converting fractions to decimals. If your calculations include decimals, you have made an error.

Because you are working with fractions, your basic calculator will not be useful.

**Tip:** When completing any assignments or worksheets, always write down the 12 times table first. This will help avoid calculation errors when converting inches into feet and inches.

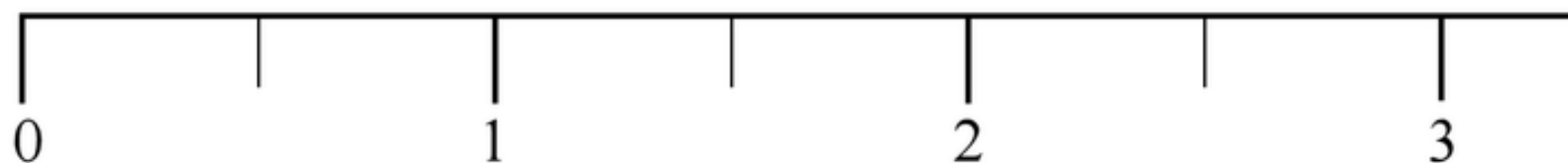
## 12 Times Table

- $12 \times 1 =$
- $12 \times 2 =$
- $12 \times 3 =$
- $12 \times 4 =$
- $12 \times 5 =$
- $12 \times 6 =$
- $12 \times 7 =$
- $12 \times 8 =$
- $12 \times 9 =$
- $12 \times 10 =$
- $12 \times 11 =$
- $12 \times 12 =$

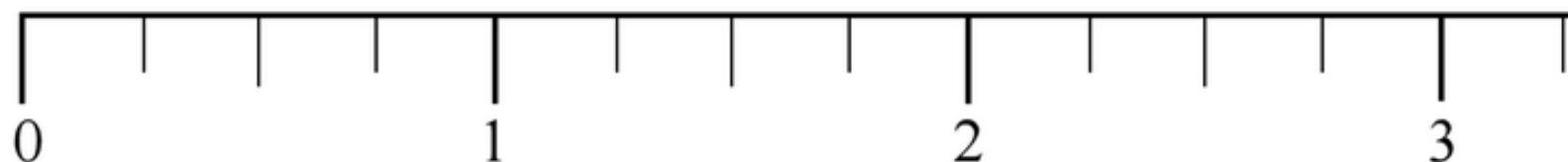
Here are four rulers that all measure in inches. They are NOT to scale. Instead, they are magnified to be “bigger” than the actual rulers, so you can see the divisions better.

The tick-  
marks are:

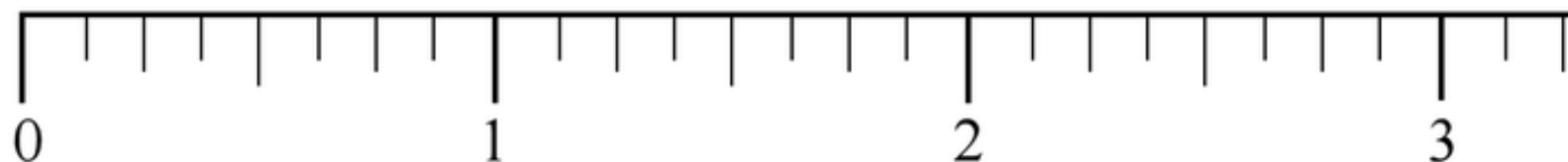
every  
1/2-inch:



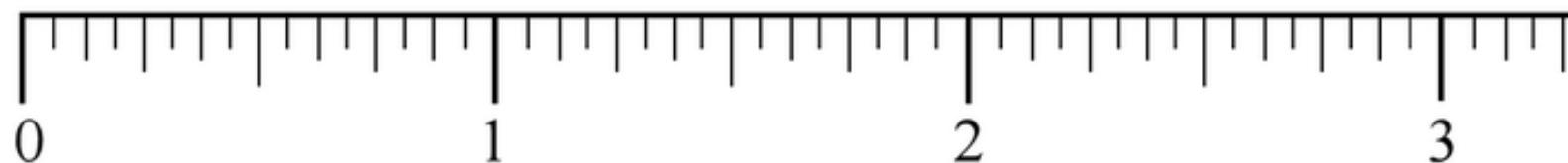
every  
1/4-inch:



every  
1/8-inch:



every  
1/16-inch:



# 1/16ths of an inch

- Tip: If you find working with 1/16ths of an inch confusing you can count each sixteenth tick to create a fraction.

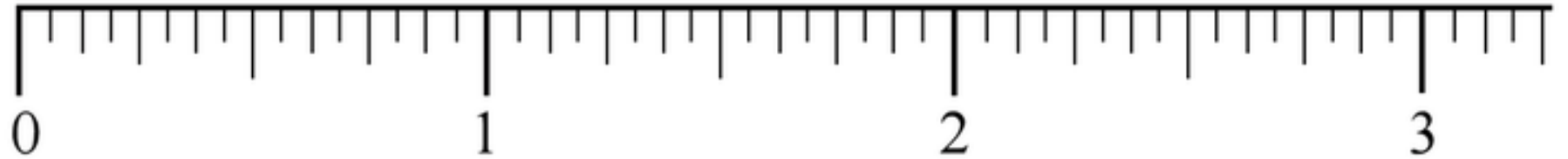
For example:

3 ticks =  $\frac{3}{16}$ ths of an inch

5 ticks =  $\frac{5}{16}$ ths of an inch

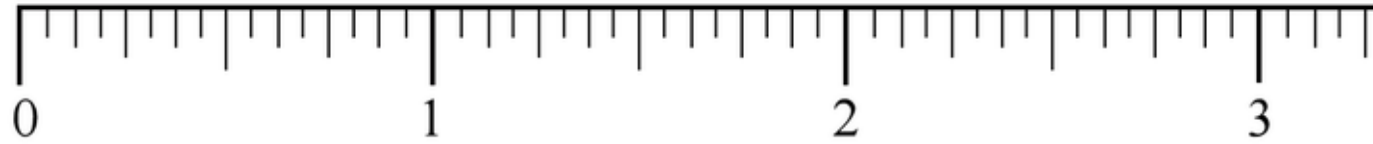
12 ticks =  $\frac{12}{16}$ ths of an inch

every  
1/16-inch:





every  
1/16-inch:



## Simplify your fractions

- You must remember to simplify your fractions

For example:

12 ticks = \_\_\_/16ths of an inch

Divide the numerator and the denominator by 4.

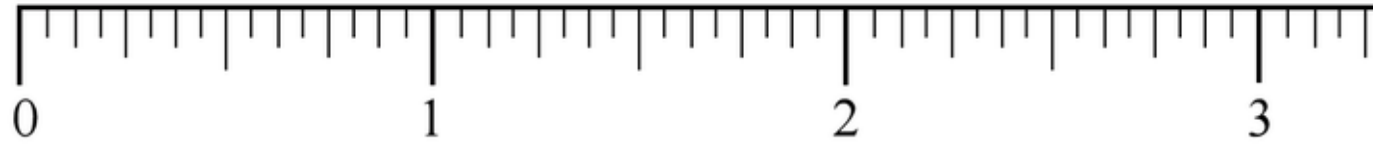
Remember: Whatever you do to the top number you **must** do to the bottom number

12 divided by 4 = \_\_\_

16 divided by 4 = \_\_\_

Simplified fraction -  $12/16'' =$  \_\_\_ of an inch or \_\_\_\_\_.

every  
1/16-inch:



# Simplify your fractions

- You must remember to simplify your fractions

For example:

12 ticks = 12 /16ths of an inch

Divide the numerator and the denominator by 4.

Remember: Whatever you do to the top number you **must** do to the bottom number

12 divided by 4 = 3

16 divided by 4 = 4

Simplified fraction -  $12/16'' = 3/4$  of an inch or three quarters of an inch.

# Conventions (symbols) how to express inches and feet in your answers

All are correct but we will use the last convention showing only the symbols of feet and inches

$$1 \text{ foot} = 1\text{ft} = 1'$$

$$1 \text{ inch} = 1\text{in} = 1''$$

# Examples of measurement conventions:

2 feet and 3 inches will be expressed as follows:

- $2' \text{ } 3''$

2 feet 3 and 1/6th of an inch will be expressed as follows

- $2' \text{ } 3 \frac{1}{6}''$  The inch mark goes at the very end of the fraction of an inch

# Examples of measurement conventions:

2 feet and 3 inches will be expressed as follows:

- 2' 3"

2 feet 3 and 1/6th of an inch will be expressed as follows

- 2' 3 1/16"    The inch mark goes at the very end of the fraction of an inch

# Worldwide systems of Measurement

- Imperial Vs Metric

## Metric System

- Most commonly used worldwide (ie: Canada, Europe)
- Lengths: kilometer, meter, centimeter, millimeter
- Canada adopted this system in 1970 to replace the Imperial System

This unit of measurement should have been taught to you in elementary school

Let's Practice using the student handout!!



The Canadian band: Metric