

# Geology 101 Lab

Week 1:

- Class Introduction -
- Measurement -
- Geologic Time Scale -

# Index Card Survey

- Name
- Major
- Favorite Food
- Interesting Fact about you

# Syllabus

# Class Expectations

- Be Here and On Time!
- Responsible use with Technology.
- Be curious.
- Ask questions.
- First 10 minutes of class – Lecture Inquiry.

# Contact Information

- Email: [aferguson@vccd.edu](mailto:aferguson@vccd.edu)
- Website: [www.mraaronferguson.com](http://www.mraaronferguson.com)
- Text:
  - Phone Number – 81010
  - Message - [@oc-geology](#)

# Agenda

- Metric Review
- Geologic Time Scale
- LAB: Geologic Time Scale

# Metric Review

---

---

## **All You Will Need to Know About Metric** (For Your Everyday Life)

---

# 10

### **Metric is based on the Decimal system**

The metric system is simple to learn. For use in your everyday life you will need to know only ten units. You will also need to get used to a few new temperatures. Of course, there are other units which most persons will not need to learn. There are even some metric units with which you are already familiar; those for time and electricity are the same as you use now.

## BASIC UNITS

**METER:** a little longer than a yard (about 1.1 yards)

**LITER:** a little larger than a quart (about 1.06 quarts)

**GRAM:** a little more than the weight of a paper clip

(comparative sizes are shown)



1 METER

1 YARD

---

## COMMON PREFIXES

(to be used with basic units)

**milli:** one-thousandth (0.001)

**centi:** one-hundredth (0.01)

**kilo:** one-thousand times (1000)

**For example**

1000 millimeters = 1 meter

100 centimeters = 1 meter

1000 meters = 1 kilometer



# Why Metric ?

Medieval systems  
(like the U.S.)  
have hundreds of  
unrelated  
complicated  
fractional units.

Translation  
on next page!



**OR THIS** (over) →

Meter  
Liter  
Gram.  
No  
Fractions.

# Just a few great Imperial units:

**One township = 36 sections or 23,040 acres where an acre = 160 square poles = 100,000 square gunter links = 43,560 square feet = 10 chains where 1 chain = 22 yards, but the engineer's chain = 100 feet.**

**On the other hand, 1 barrel = 42 gallons or 196 pounds or 55 gallons. But 1 gallon = 4 quarts with 2 pints per quart or 4 cups. Unless it's the Queen Anne wine gallon, the milk gallon, or the imperial gallon.**

**However we have 62.4 pounds per cubic foot for water.**

**Now then there is the statute mile, the league, the nautical mile, and the marine league.**

**Sheeeeshhh.... More...**

- LO – Use the metric system to convert between units.

**Gasp!** There is the liquid pint = 28.875 cubic inches, the liquid quart = 128 drams = 7680 minims. Ah, but 1 tea spoon = 1 1/3 drams which is 238 scruples.

So there is the Troy ounce, the Avoirdupois ounce and a pound of feathers is not the same as a pound of gold.

Oooh, we have the short ton and the long ton. Do not get these confused with the furlong or the fathom.

Bushells and pecks, palms and hands should have nothing to do with carats.

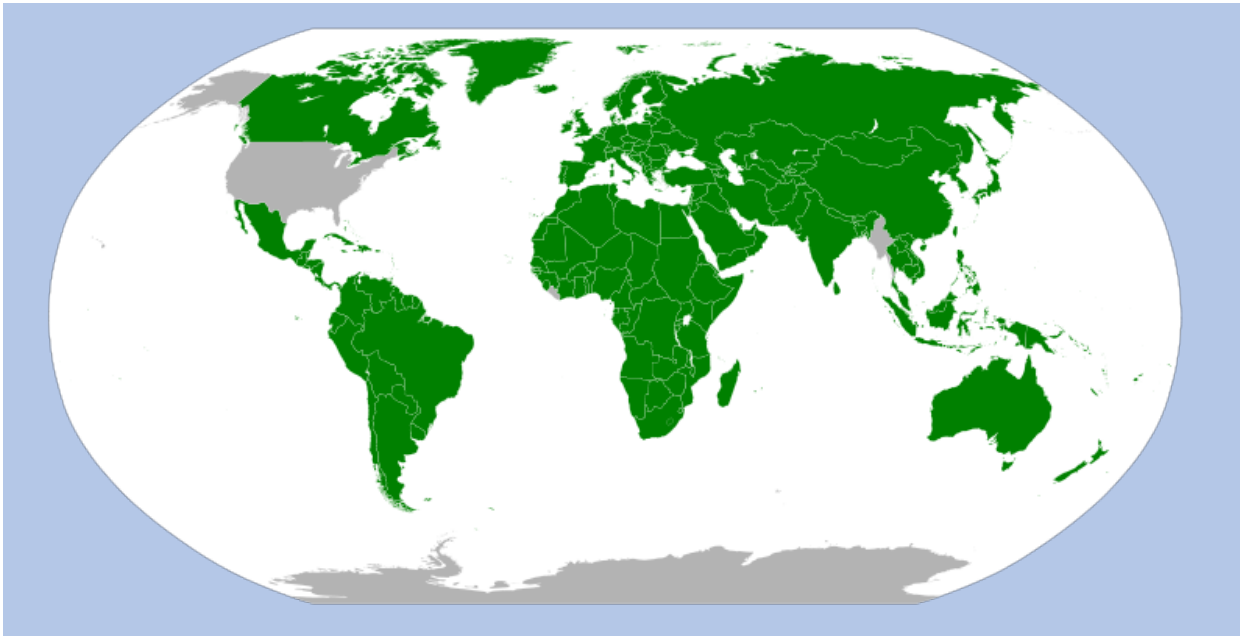
Watch out for the rod!!

And many Americans think we should hang on to this!!

***Meter, Liter, Gram and no fractions!***

# Who Uses Metric (Shown in green)?

- Meter, Liter, Gram— No Fractions!  
(Based on multiples of 10)



Map indicating  
where the metric  
system is official.

# Metric Units (SI Units)

- **Length** – Meter (m, cm, mm)
- **Volume** – Liter (ml or L)
- **Time** – seconds (sec)
- **Mass** – grams (mg or kg)
- **Temperature** – Kelvin (K) or Celsius (°C)

# Conversions: Dimensional Analysis

- Uses conversion “factors”

$$\text{if } a = b, \text{ then } \frac{a}{b} = 1 \quad \text{and} \quad \frac{b}{a} = 1$$

$$\text{if } 1 \text{ min.} = 60 \text{ s, then } \frac{1 \text{ min.}}{60 \text{ s}} = 1 \quad \text{and} \quad \frac{60 \text{ s}}{1 \text{ min.}} = 1$$

$$\text{Starting Units} \times \frac{\text{Desired Units}}{\text{Starting Units}} = \text{Desired Units}$$

# Conversions: Dimensional Analysis (“Factor-Label” method)

- Step 1: Write given value w/ unit
- Step 2: Multiply by **conversion factor (fraction w/ desired units on top)** so that units cancel out.
  - Ex: Convert 0.03 m to cm.
  - Ex: How many mL are in  $\frac{3}{4}$  cup?
  - Ex: How many seconds are in 6 years?

$$\text{Starting Units} \times \frac{\text{Desired Units}}{\text{Starting Units}} = \text{Desired Units}$$

$$\text{Starting Units} \times \frac{\text{Linking Units}}{\text{Starting Units}} \times \frac{\text{Desired Units}}{\text{Linking Units}} = \text{Desired Units}$$

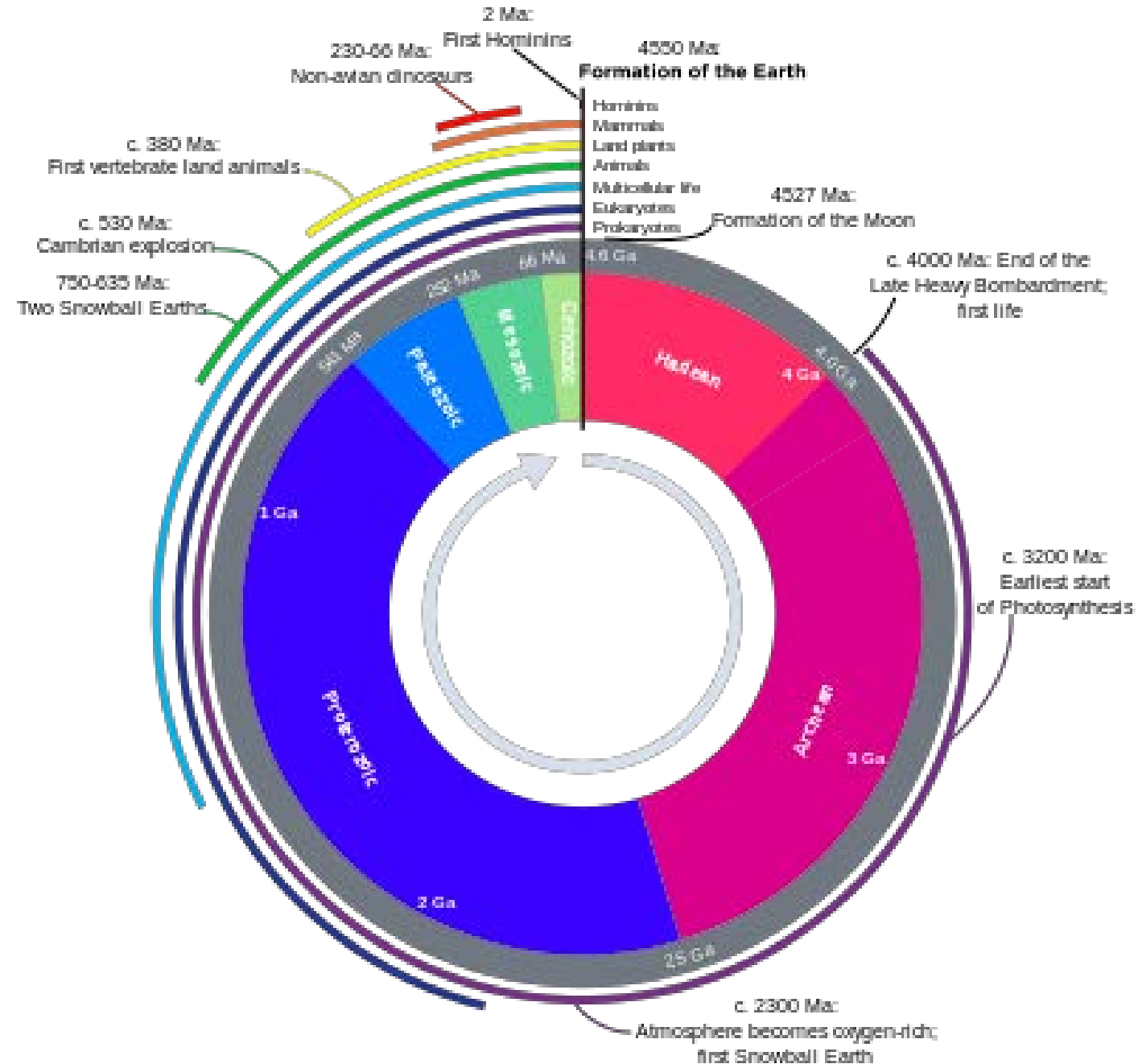
# Proper Measurement

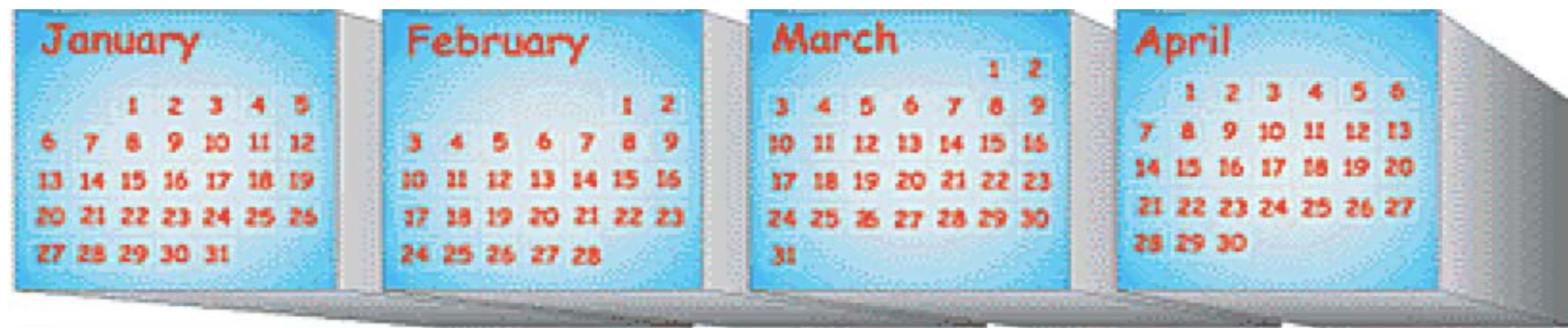
- Be Observant
- Be Exact
- Don't round unless told to.
- Learn about the tool before you use it.
- Use the proper tool for the job.



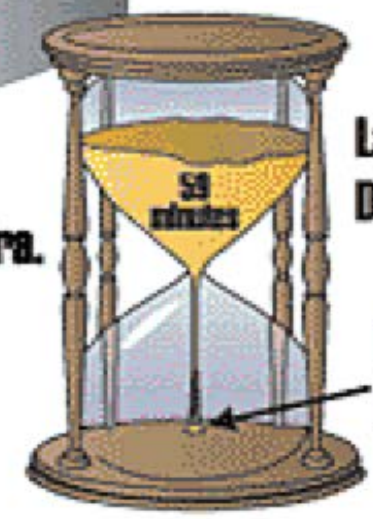
# Geologic Time Scale

- Earth is 4.6 billion years old
- Geologic time is split into:
  - Eons
  - Eras
  - Periods
- asdf





- Geological time before Paleozoic Era.
- Paleozoic Era
- Mesozoic Era
- Cenozoic Era



**Last Hour of December 31**

**Humans time on Earth**

# Two ways to relate Time in Geology

- **Relative**: Process of determining when something formed or happened in relation to other events.
  - Example: Stating you are the older brother to your younger sister.
- **Absolute**: Process of determining when something formed or happened in exact units of time.
  - Example: Stating your age in years compared to your sister's age in years.

# LAB: Geologic Time Scale

- Objective: Understand the Geologic Time Scale, in absolute time, and the age of different events throughout history.
- Groups of 2 or 3:
  - Using the appropriate tools you will recreate the geologic time scale outside using sidewalk chalk. (or inside using receipt paper if the weather does not permit)
  - Start by converting the ages using the scale provided in the Lab handout.
  - Lab is due at the end of the class.