Intro to GLOBE

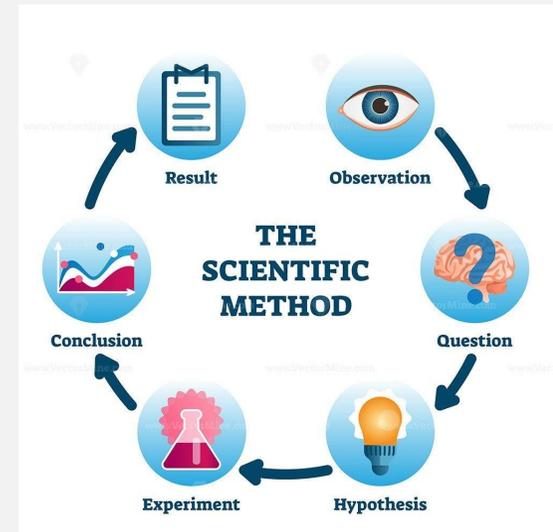### And Other Cool Science-y Stuff!

Prepared by:
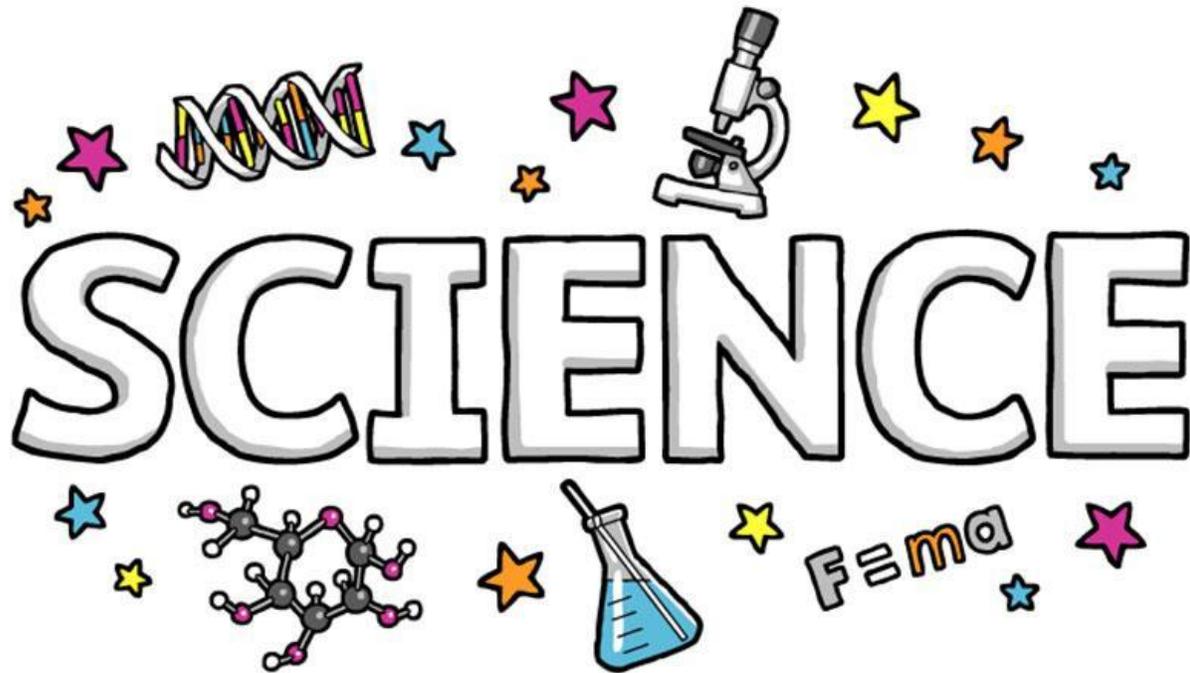
Sara Mierzwiak

Research Assistant

GLOBE Mission EARTH

What is Scientific Research?

- Discuss some ideas on what you think it is!

- What are some examples of scientific research?

- If you could do a scientific investigation on anything, what would it be?

- Can you think of some issues around your natural environment you could investigate?
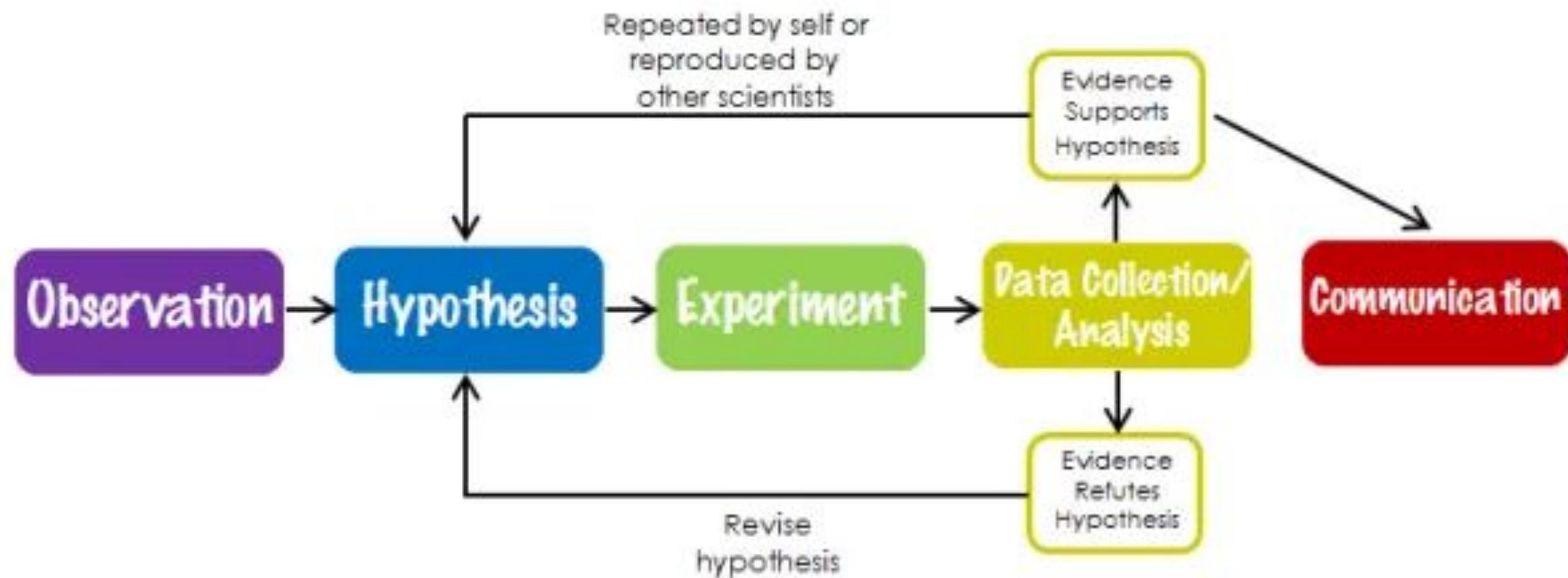
How do we DO science?

We use the SCIENTIFIC METHOD!

Can you describe how the SCIENTIFIC METHOD works??

Discuss!

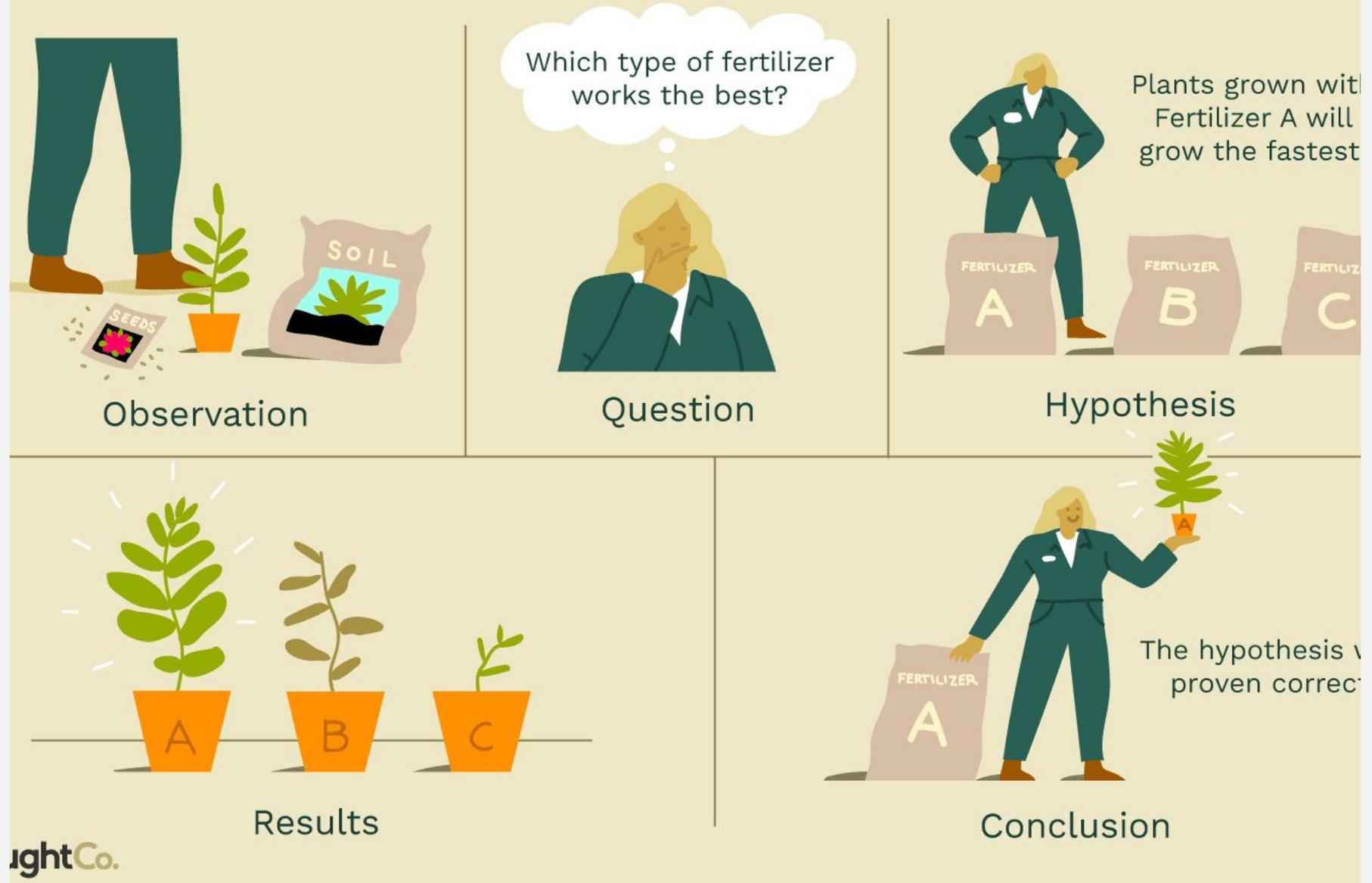# The Scientific Method

Repeated by self or
reproduced by
other scientists

Evidence
Supports
Hypothesis

Observation → **Hypothesis** → **Experiment** → **Data Collection/Analysis** → **Communication**

Evidence
Refutes
Hypothesis

Revise
hypothesis
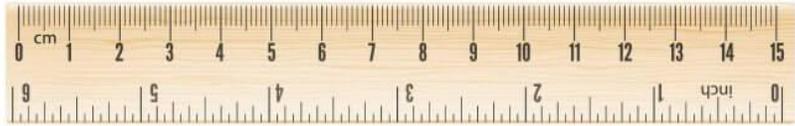
Example of a research study employing the scientific method

Most scientists around the world use the Metric System instead of the English System.

÷ 1000	÷ 100	÷ 10	Base unit	× 10	× 100	× 1000
Kilo-	Hecto-	Deca-	Meter Gram Liter	Deci-	Centi-	Milli-
× 1000	× 100	× 10	Base unit	÷ 10	÷ 100	÷ 1000
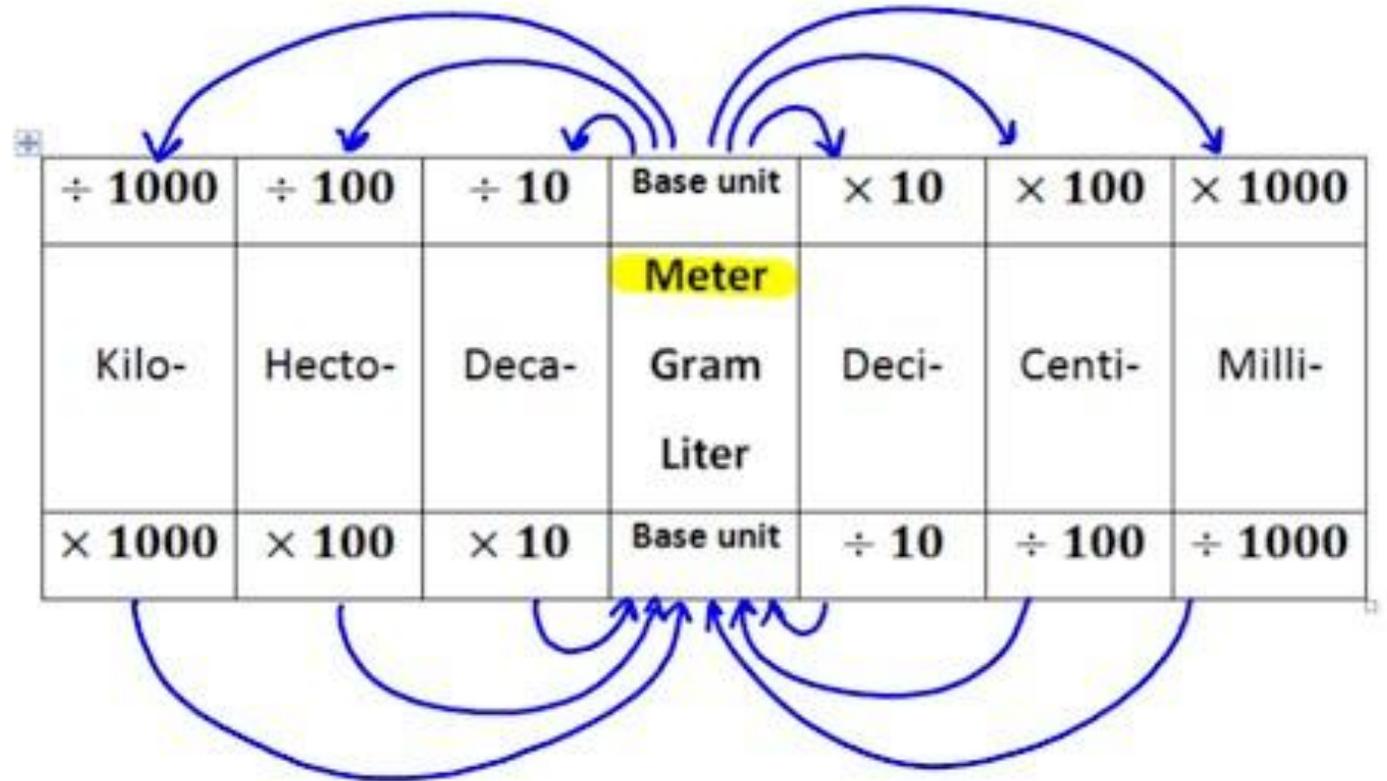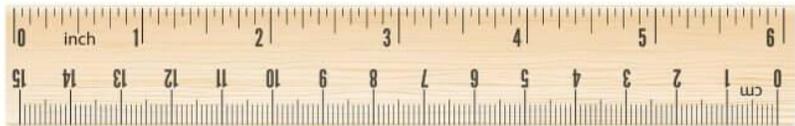
Review these metric measurements…

The Metric System

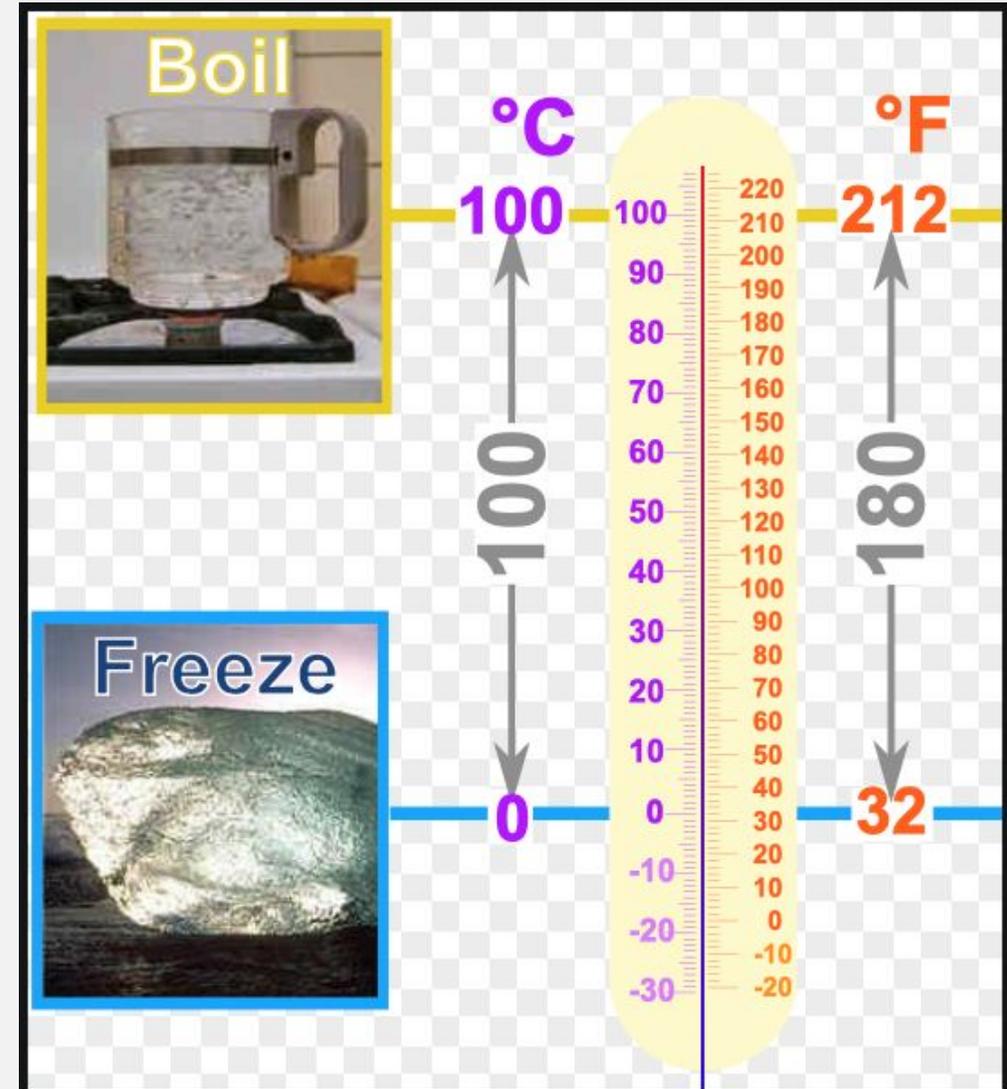|	
length	1 meter = 100 centimeters
	1 centimeter = 10 millimeters
distance	1 kilometer = 1,000 meters
weight	1 kilogram = 1,000 grams
volume	1 liter = 1,000 milliliters
temperature	0° Celsius = freezing point of water
	100° Celsius = boiling point of water

Can you finish this rhyme???

"30 is HOT
20 is NICE
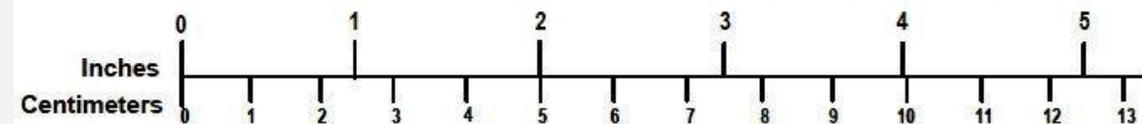10 is COLD
0 is _____?"

If you said "ICE" you are correct!
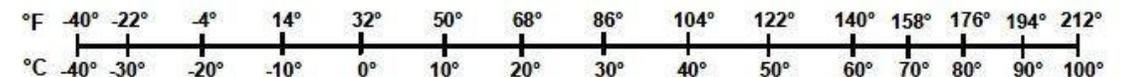
"30 is HOT
20 is NICE
10 is COLD
0 is ICE!"

Conversion chart (for reference)

ENGLISH TO METRIC	METRIC TO ENGLISH
LENGTH (APPROXIMATE)	**LENGTH (APPROXIMATE)**
1 inch (in) = 2.5 centimeters (cm)	1 millimeter (mm) = 0.04 inch (in)
1 foot (ft) = 30 centimeters (cm)	1 centimeter (cm) = 0.4 inch (in)
1 yard (yd) = 0.9 meter (m)	1 meter (m) = 3.3 feet (ft)
1 mile (mi) = 1.6 kilometers (km)	1 meter (m) = 1.1 yards (yd)
	1 kilometer (km) = 0.6 mile (mi)
AREA (APPROXIMATE)	**AREA (APPROXIMATE)**
1 square inch (sq in, in^2) = 6.5 square centimeters (cm^2)	1 square centimeter (cm^2) = 0.16 square inch (sq in, in^2)
1 square foot (sq ft, ft^2) = 0.09 square meter (m^2)	1 square meter (m^2) = 1.2 square yards (sq yd, yd^2)
1 square yard (sq yd, yd^2) = 0.8 square meter (m^2)	1 square kilometer (km^2) = 0.4 square mile (sq mi, mi^2)
1 square mile (sq mi, mi^2) = 2.6 square kilometers (km^2)	10,000 square meters (m^2) = 1 hectare (ha) = 2.5 acres
1 acre = 0.4 hectare (he) = 4,000 square meters (m^2)	
MASS - WEIGHT (APPROXIMATE)	**MASS - WEIGHT (APPROXIMATE)**
1 ounce (oz) = 28 grams (gm)	1 gram (gm) = 0.036 ounce (oz)
1 pound (lb) = 0.45 kilogram (kg)	1 kilogram (kg) = 2.2 pounds (lb)
1 short ton = 2,000 pounds (lb) = 0.9 tonne (t)	1 tonne (t) = 1,000 kilograms (kg)
	= 1.1 short tons
VOLUME (APPROXIMATE)	**VOLUME (APPROXIMATE)**
1 teaspoon (tsp) = 5 milliliters (ml)	1 milliliter (ml) = 0.03 fluid ounce (fl oz)
1 tablespoon (tbsp) = 15 milliliters (ml)	1 liter (l) = 2.1 pints (pt)
1 fluid ounce (fl oz) = 30 milliliters (ml)	1 liter (l) = 1.06 quarts (qt)
1 cup (c) = 0.24 liter (l)	1 liter (l) = 0.26 gallon (gal)
1 pint (pt) = 0.47 liter (l)	
1 quart (qt) = 0.96 liter (l)	
1 gallon (gal) = 3.8 liters (l)	
1 cubic foot (cu ft, ft^3) = 0.03 cubic meter (m^3)	1 cubic meter (m^3) = 36 cubic feet (cu ft, ft^3)
1 cubic yard (cu yd, yd^3) = 0.76 cubic meter (m^3)	1 cubic meter (m^3) = 1.3 cubic yards (cu yd, yd^3)
TEMPERATURE (EXACT)	**TEMPERATURE (EXACT)**
[(x-32)(5/9)] °F = y °C	[(9/5) y + 32] °C = x °F

QUICK INCH - CENTIMETER LENGTH CONVERSION

Inches: 0 1 2 3 4 5

Centimeters: 0 1 2 3 4 5 6 7 8 9 10 11 12 13

QUICK FAHRENHEIT - CELSIUS TEMPERATURE CONVERSION

°F -40° -22° -4° 14° 32° 50° 68° 86° 104° 122° 140° 158° 176° 194° 212°

°C -40° -30° -20° -10° 0° 10° 20° 30° 40° 50° 60° 70° 80° 90° 100°

Find any place on the Earth with Latitude and Longitude!
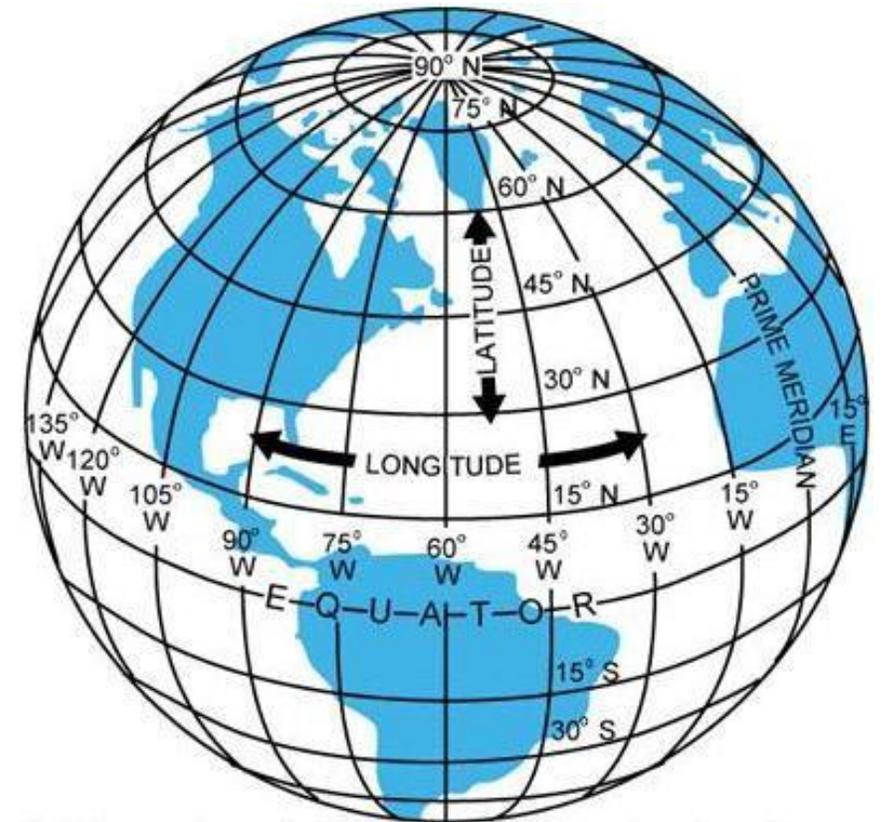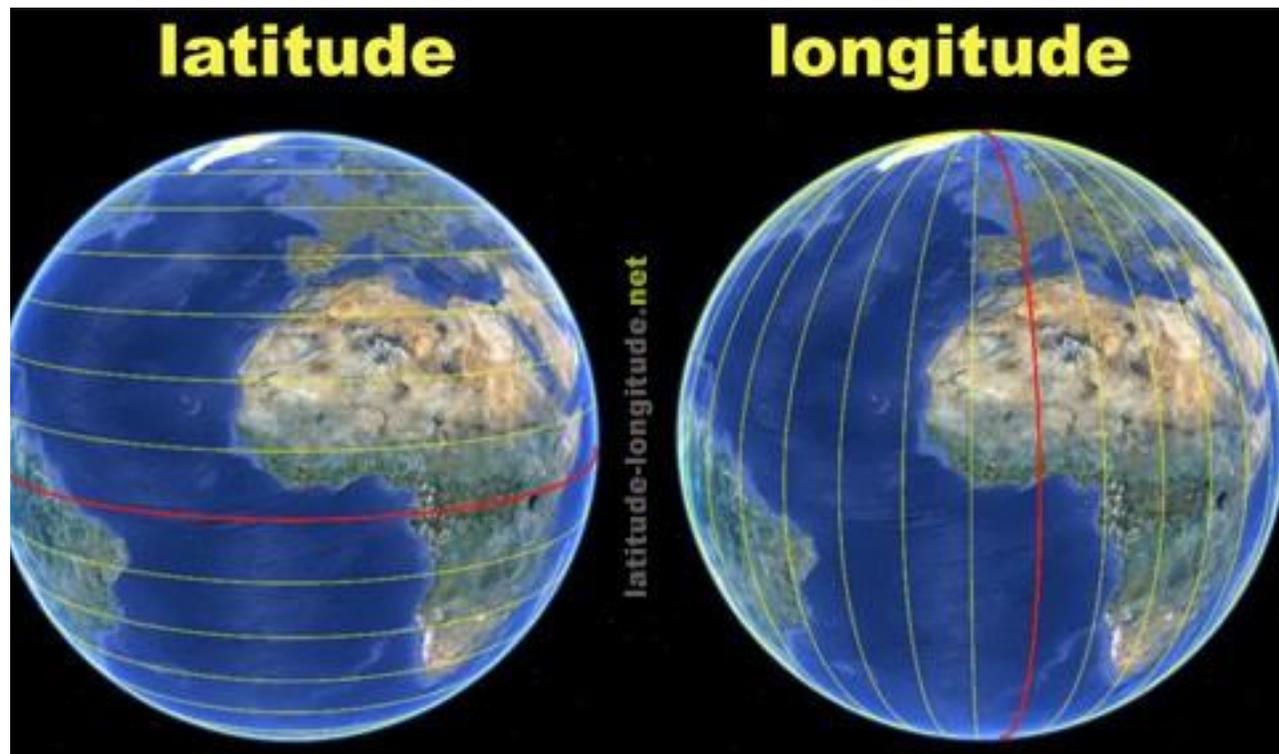
Lines of Latitude look like a ladder, and run east – west around the globe

How do we find our Latitude & Longitude?

1. You can use a GPS or a GPS App on your phone!

Check out my favorite GPS app, called "GPS & Maps".

-OR- On a computer

2. You can go to www.maps.google.com, zoom in to your location, right click and select "What's Here?". It will show you the Latitude and Longitude coordinates for your location! Easy as pie!

Why do we need Latitude & Longitude coordinates?

- So we can record where on the planet we collected our data from!

- With those coordinates, anyone can return to that location and collect more data to compare to your data.
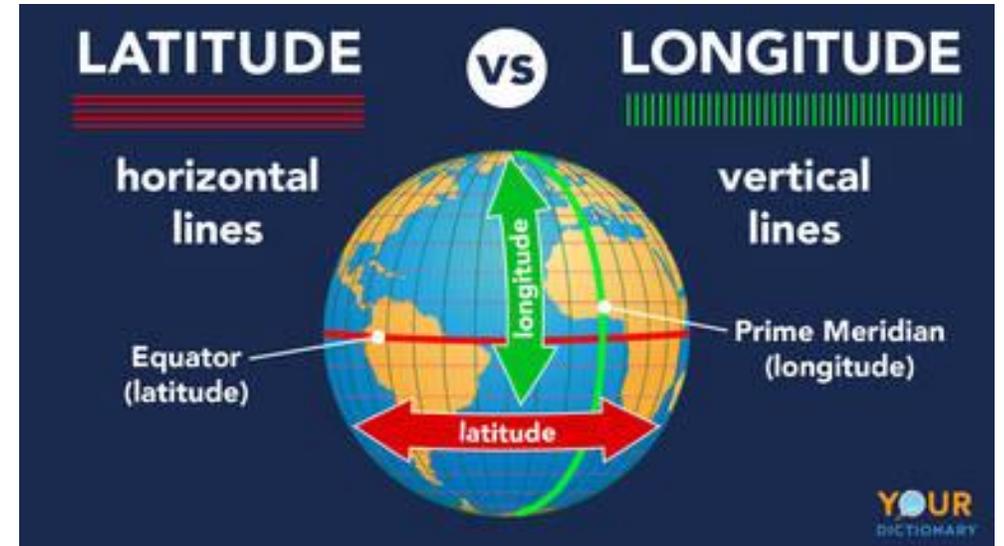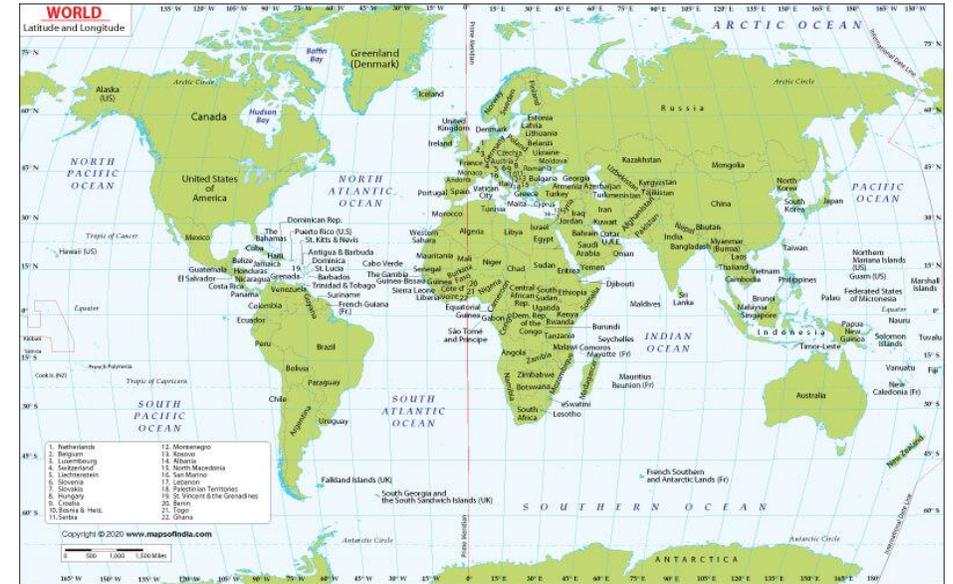
Through GLOBE, you can be a scientist!

GLOBE uses standard sampling "protocols"

- These "protocols" make sure that students and citizen scientists around the world use the same procedures to collect good, representative data.

- GLOBE Protocols are divided into four spheres:

- All of these are part of

studying the

"Earth as a System"

GLOBE E-trainings

You can get trained online for all of the GLOBE Protocols!

Go to the link below and scroll down to view the Modules.

Test your knowledge with the Assessments!

https://www.globe.gov/get-trained/protocol-etraining

You can also use the GLOBE Observer App!

Students from around the world participate in GLOBE and do REAL scientific research!

- They collect REAL scientific data from the world around them

- They analyze that data and conduct an investigation

- They prepare a research project (can include a poster and presentation)

- They present their research at Student Science Symposia and Virtual Symposia!

"This was a wonderful experience and I've been telling people how much fun I had. I really appreciate the opportunity to help out and see what wonderful science GLOBE is supporting across the world!"

-UCAR Staff and IVSS Judge, 2019

Now let's get started doing SCIENCE
WITH The GLOBE Program!

YOUR GLOBE ACCOUNT LOG-IN INFO

GO TO www.globe.gov

And use your student log-in info as shown below:

EMAIL ADDRESS:

PASSWORD: