

## Today's "Plan"—Tuesday January 3, 2023

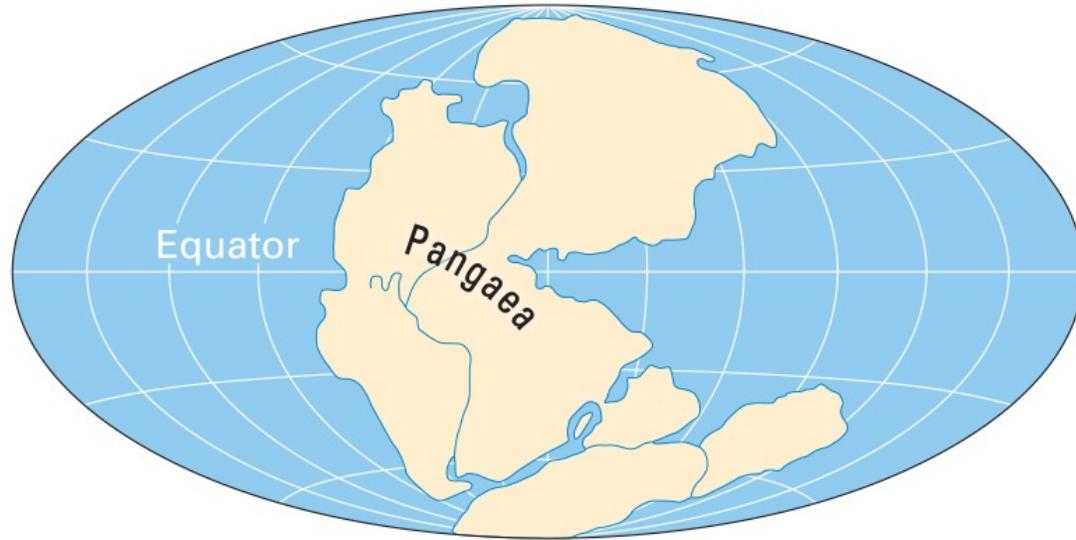
1. Attendance/Brain Stretcher
2. Overview of the Earth's History
3. Video: History of the Earth in 10 minutes
4. ***Inside Earth Project***
5. ***Turn in what you have to Schoology—it is called "Inside Earth, Day 1"***

### Today's Learning Objectives:

Identify key events in our Earth's history (Geologic Time Scale).



# CONTINENTAL DRIFT OF PLATES



225 Million Years Ago



150 Million Years Ago

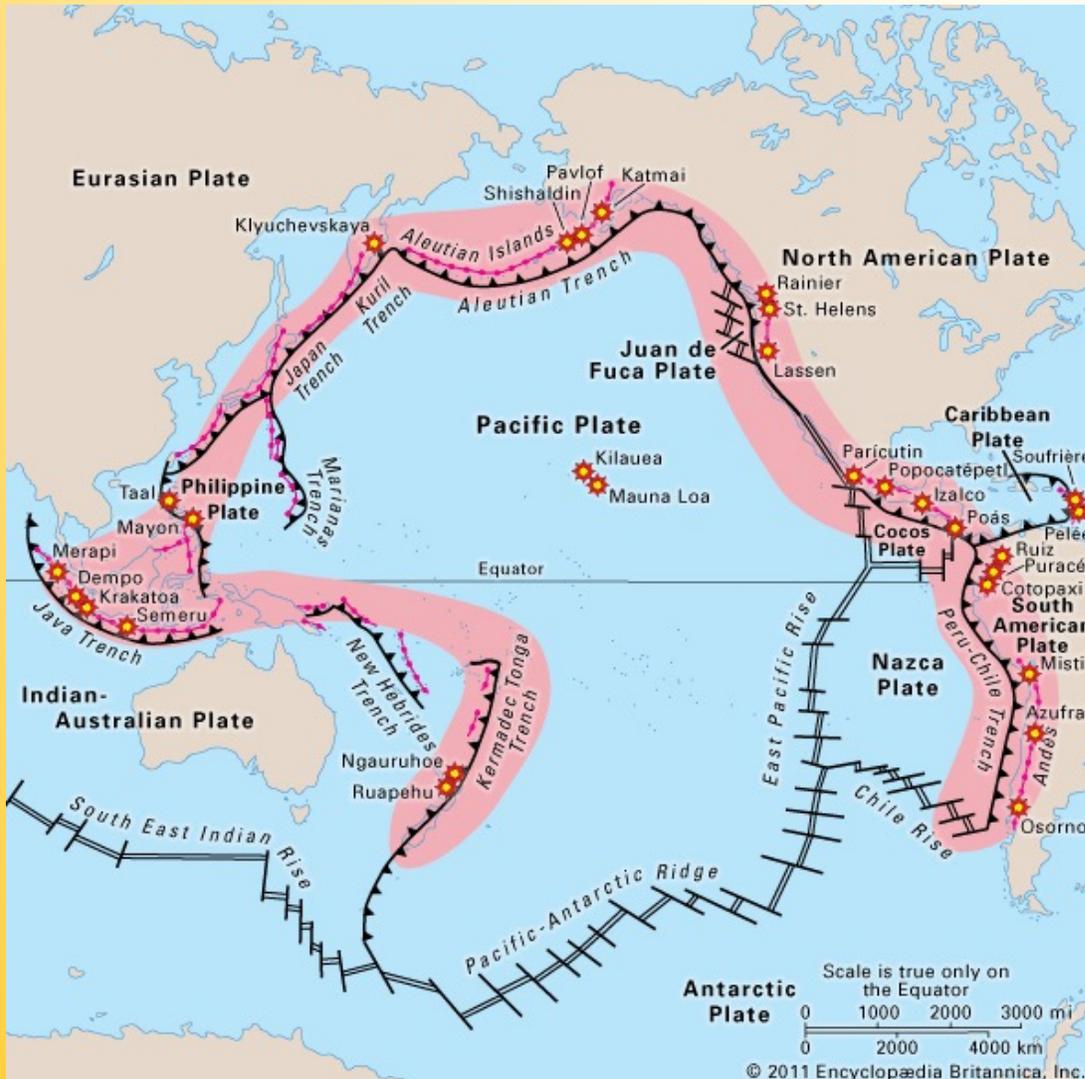


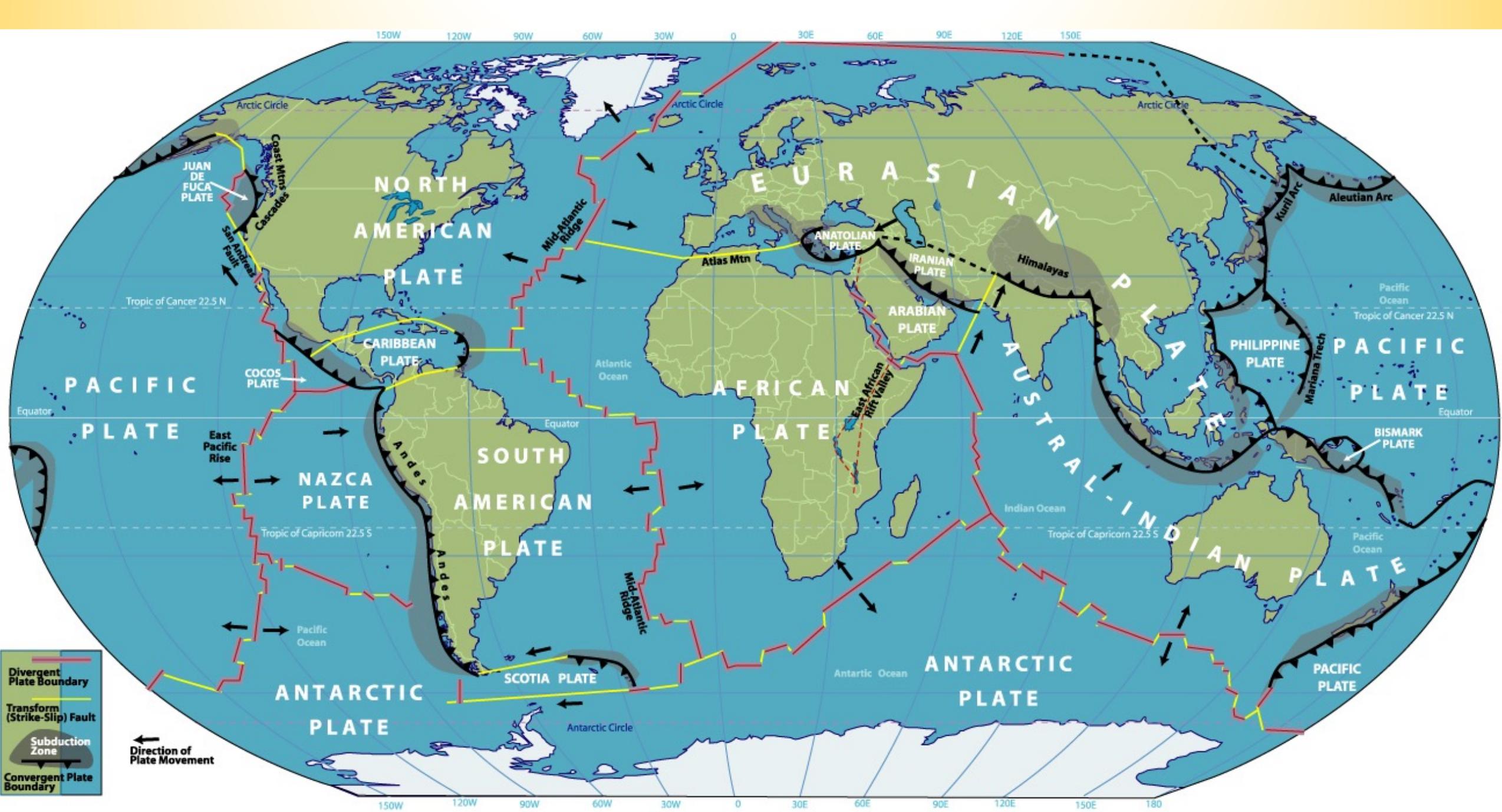
100 Million Years Ago



Earth Today

# Significant Earthquakes in History





**Divergent Plate Boundary**

**Transform (Strike-Slip) Fault**

**Subduction Zone**

**Convergent Plate Boundary**

**Direction of Plate Movement**

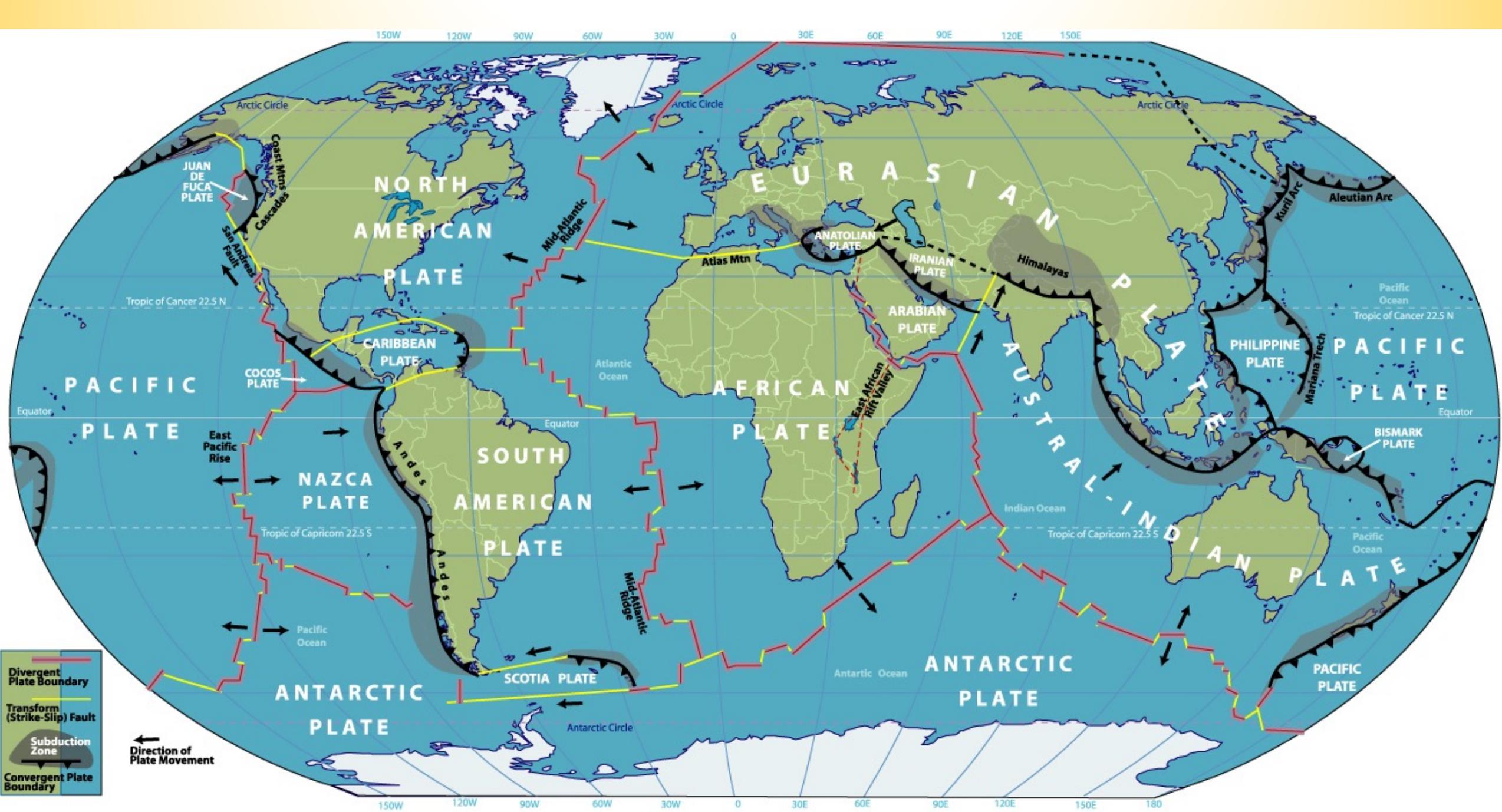


# EARTHQUAKE MAGNITUDE SCALE



Where & when was the largest earthquake ever recorded in terms of magnitude?

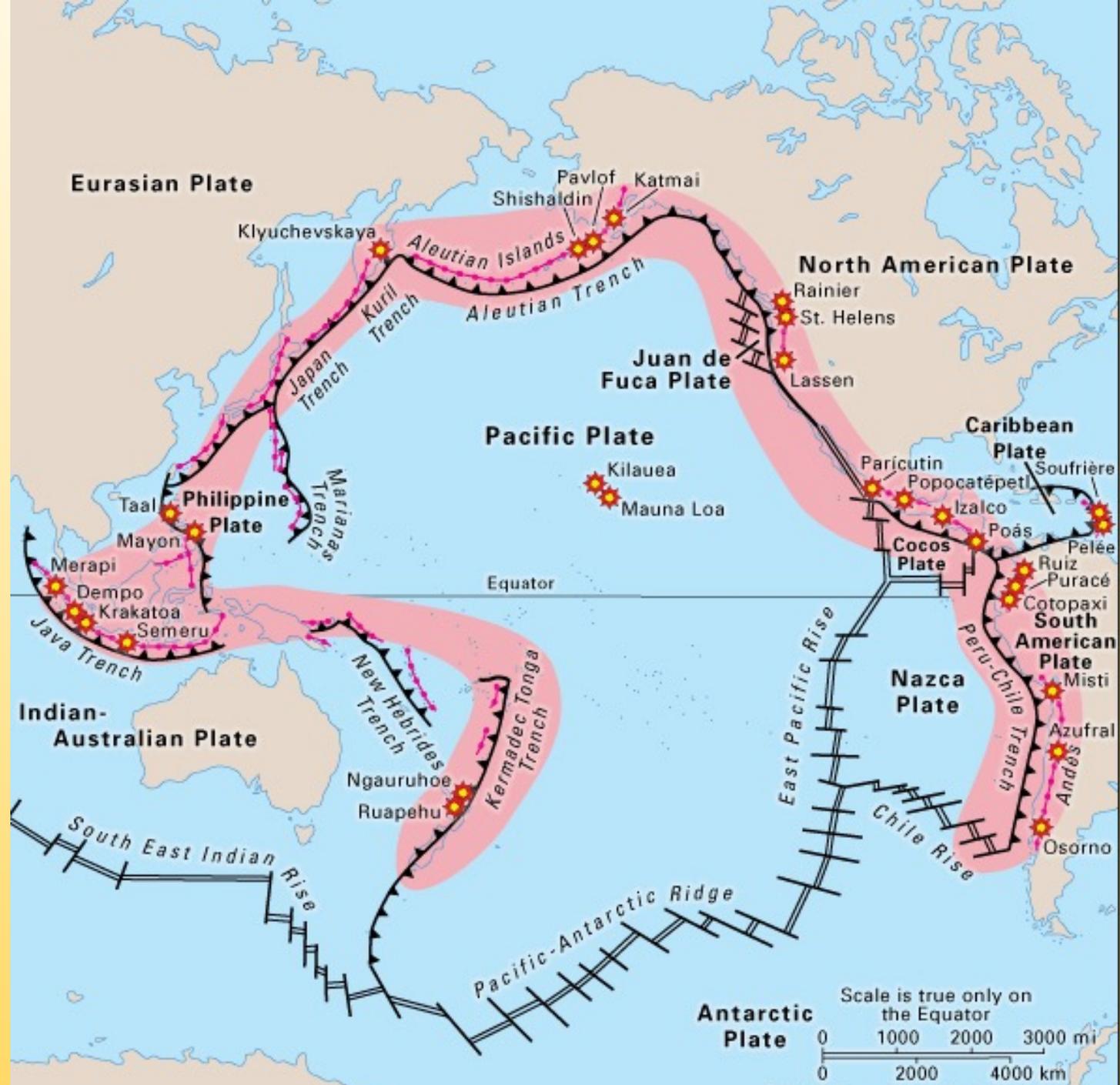
Chile in 1960



The 2<sup>nd</sup> largest earthquake ever recorded in terms of magnitude was...

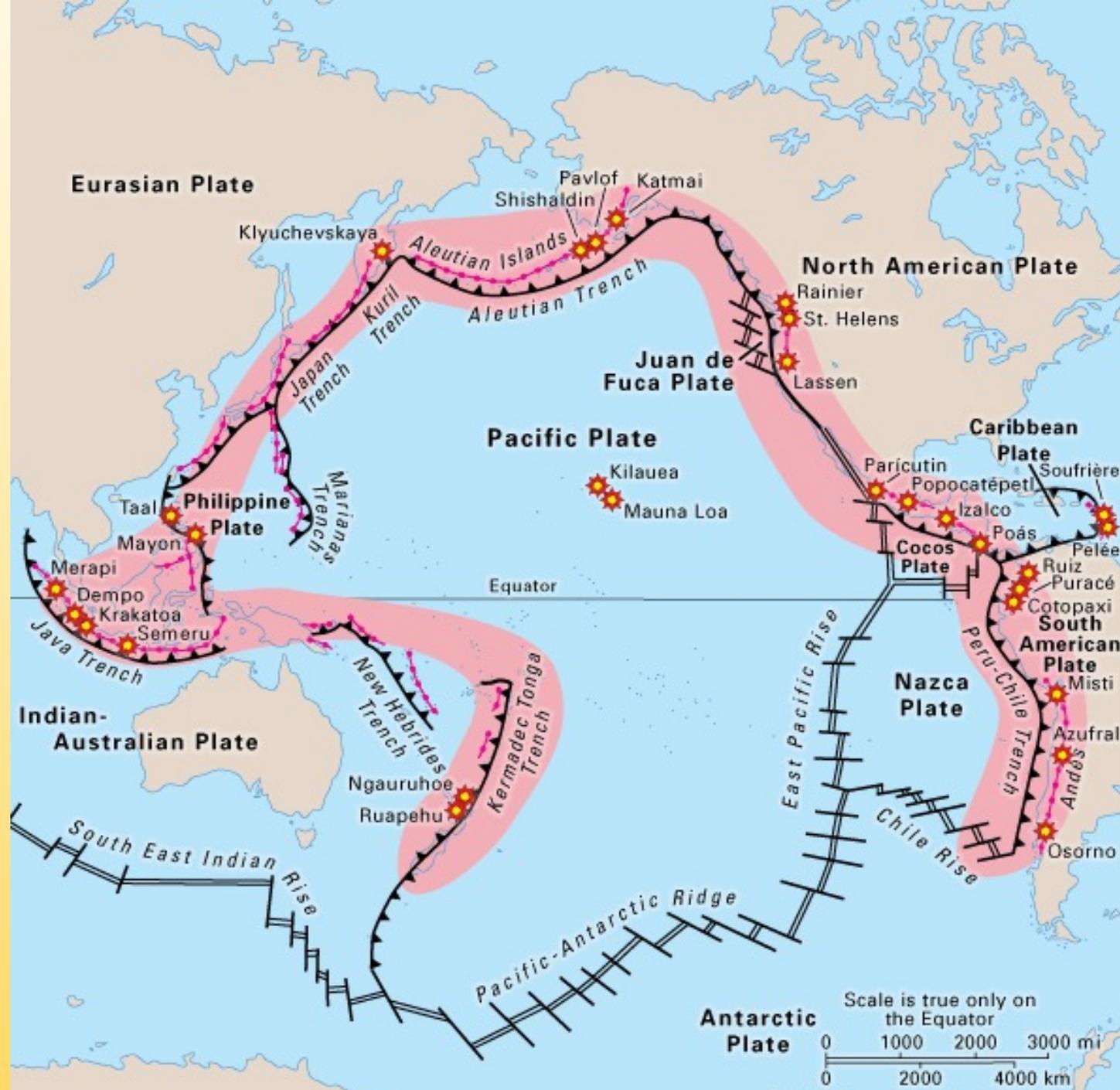
Alaska in 1964





The 2<sup>nd</sup> largest earthquake ever recorded in terms of magnitude was...

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The two largest earthquakes in terms of the number of deaths caused were in which country?

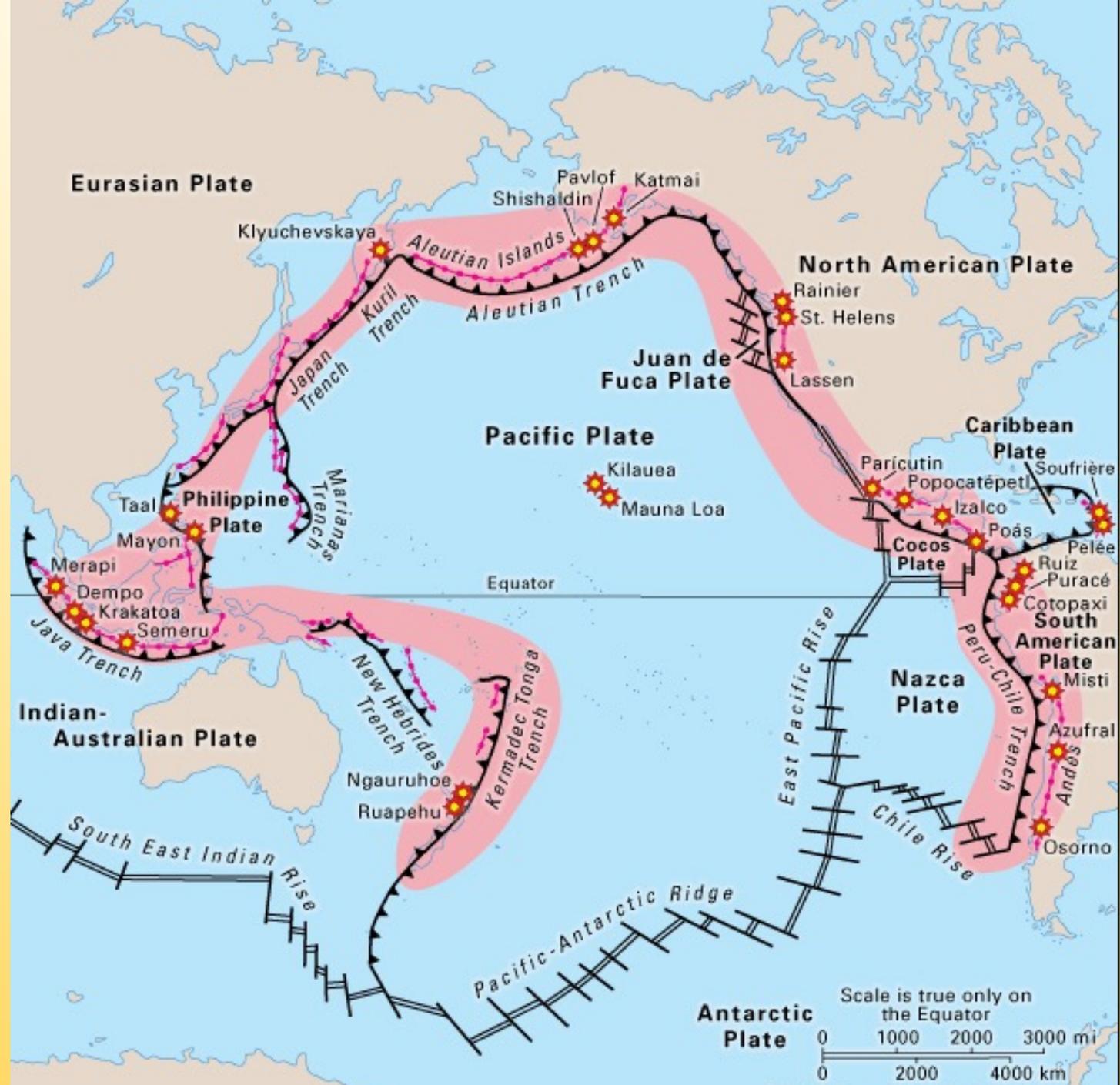
China

1556— claimed about 830,000 lives

1976—claimed around 250,000 lives

The third largest earthquake by death toll was also in that part of the world, in 2004.

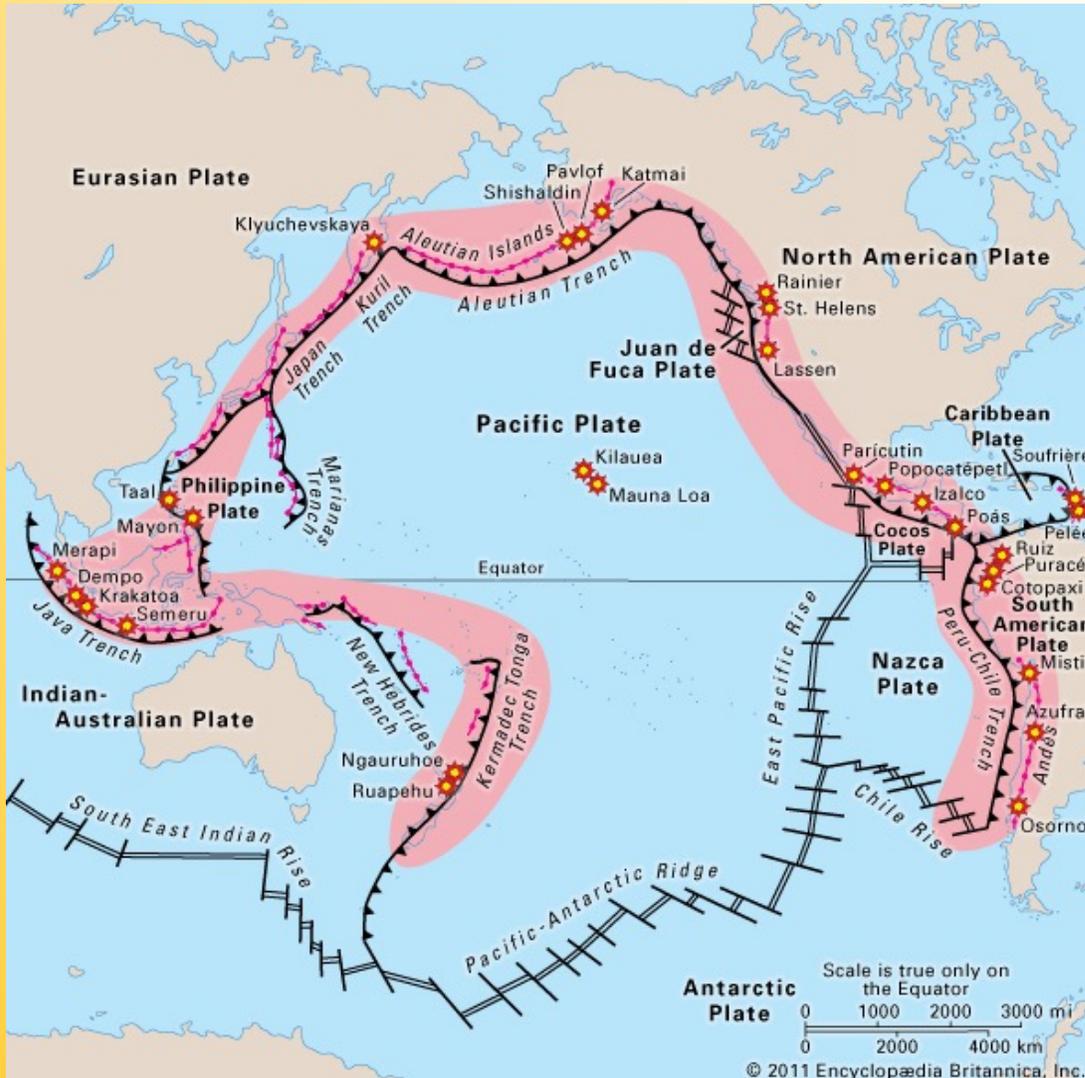
Indian Ocean earthquake, caused tsunamis; claimed around 230,000 lives



Another significant recent earthquake was in 2011, damaging a nuclear reactor in Japan.



# Significant Earthquakes in History



## **Inside Earth Project:**

For this project, I have selected 3 options of information from this unit. **You will choose 1 of the 3.** For the option you choose, be sure to cover the information listed.

As always, use any format you choose (Keynote, iMovie, doing by hand, etc.). On a lot of these, a picture is worth a 1000 words as they say—so feel free to use diagrams, sketches, and/or examples.

# ***Option A: The Earth's Structure***

- **Formation of the Earth**
  - Give a ***brief*** overview of how scientists believe the Earth originally formed.
- **Layers of the Earth**
  - What are the major layers of the Earth? Name and describe them (pictures would be good here)
- **Movements of the Continents over Time**
  - Have the continents always been where they currently are? Scientists don't think so. Show how they have moved over time (once again, pictures and/or videos would work real well for this).

# **Option B: Earthquakes**

- **Types of Faults**
  - Faults are those cracks in the Earth's plates, and that is where earthquakes typically occur. What are some of the main types of faults (the book might be helpful on this)?
- **Historic Earthquakes**
  - Research 3 significant earthquakes and briefly describe them (when and where did they occur, what made them significant).
- **Earthquake "prevention"**
  - No, we can't prevent earthquakes. But what are some things that are done in places that receive a lot of earthquakes to prevent damage? How are buildings designed differently? What would you do in the event of an earthquake? We do fire drills at our school. Where I grew up in the Ozarks, we did tornado drills. What would an earthquake drill look like?

# **Option C: Rocks & Volcanoes**

- **The Rock Cycle**
  - Give us a quick refresher on the Rock Cycle and the 3 main types of rocks. A diagram would be good here.
- **Types of Volcanoes**
  - There are different types of volcanoes, and not all of them are the kind that go “Ka-Bloo-Ey” like we see in the movies. Describe a few of the different basic types of volcanoes. Pictures and brief descriptions might work well here.
- **Historic Volcanoes**
  - Research 3 significant volcanoes and briefly describe them (when and where did they occur, what made them significant).

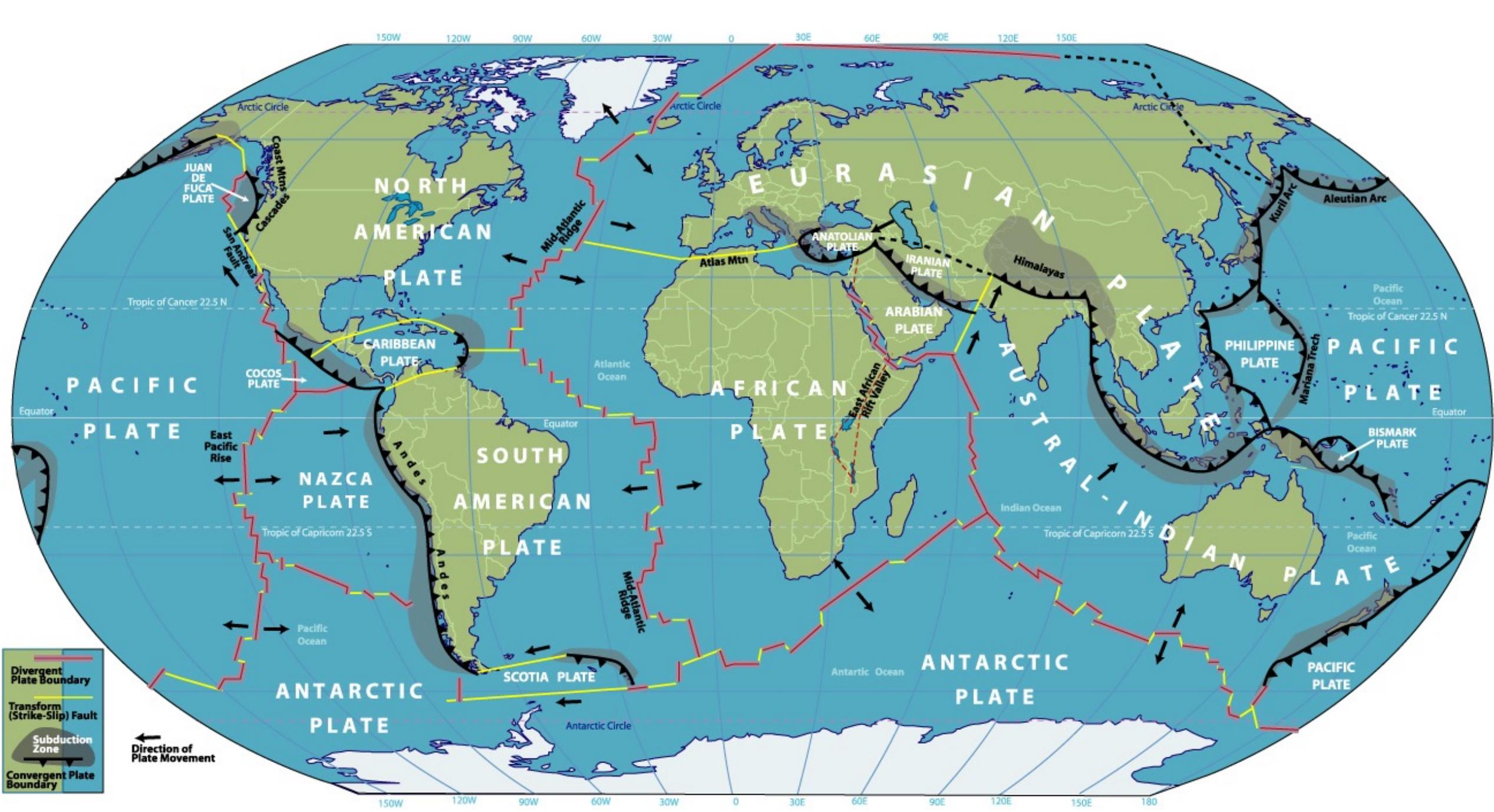
# Today's "Plan" — Wednesday January 4, 2023

1. Attendance/Brain Stretcher
2. Significant Volcanoes in our history
3. Unit Pre-Test
4. ***Continue Inside Earth Project***

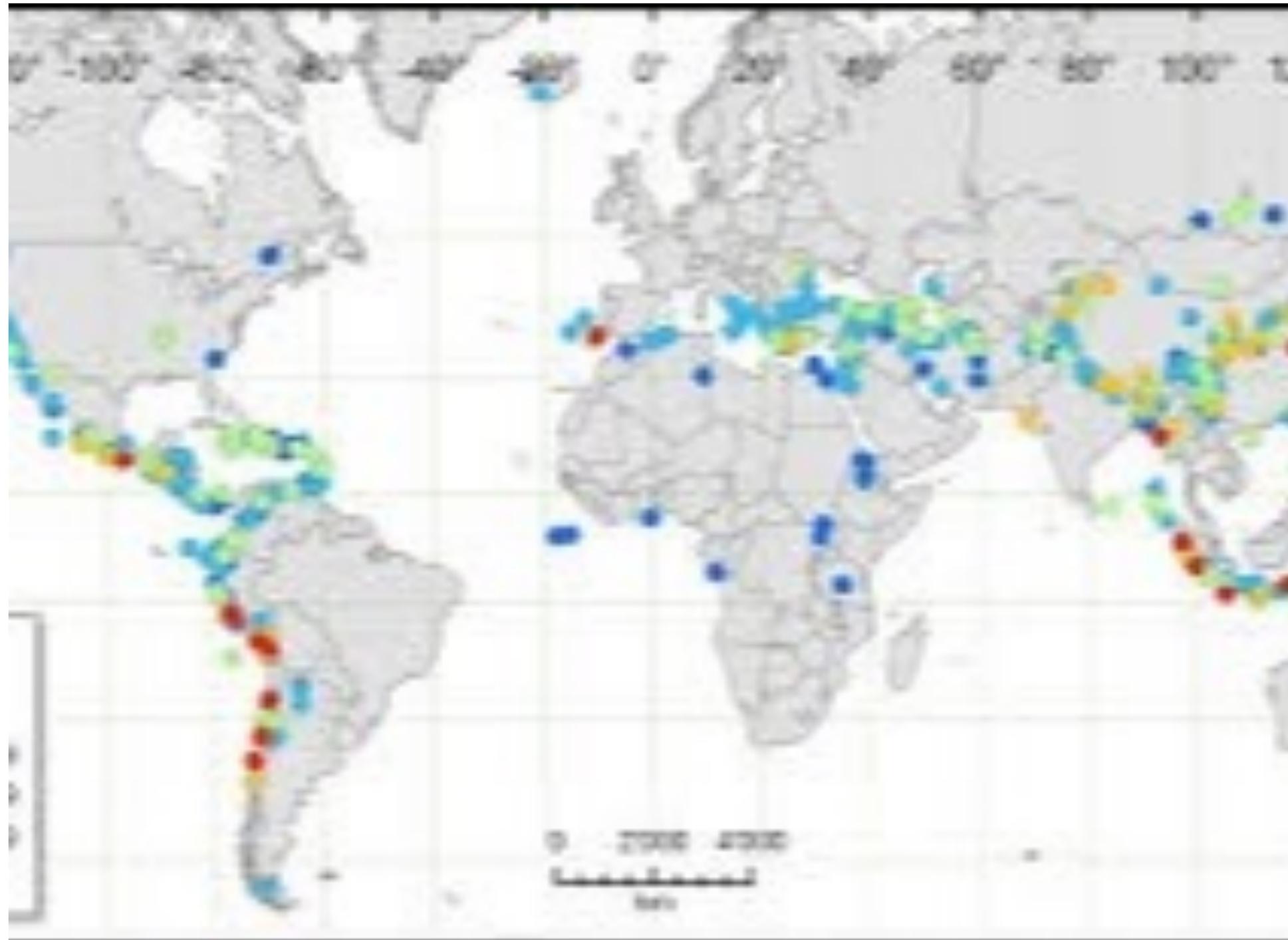
## Today's Learning Objectives:

Identify key events in our Earth's history (Geologic Time Scale).





— Divergent Plate Boundary  
— Transform (Strike-Slip) Fault  
 Subduction Zone  
→ Direction of Plate Movement  
 Convergent Plate Boundary







Before 1980

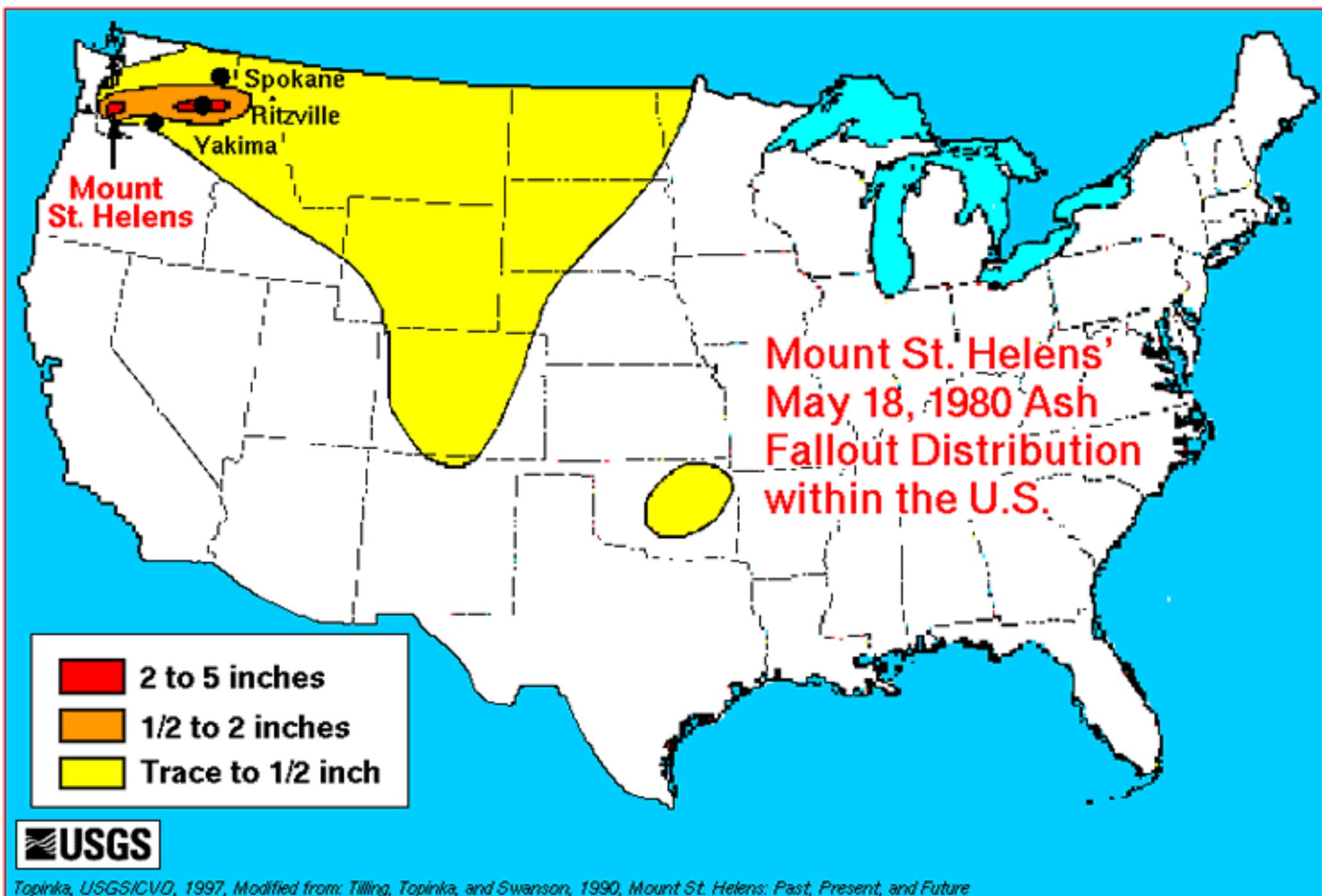


After 1980

# Mt. St. Helens







## **Basic Volcano “Stuff”:**

What is the difference between magma and lava?

- **Magma**: molten rock below the Earth’s surface.
- **Lava**: molten rock above the Earth’s surface.

Volcanoes can be “alive” for thousands or even millions of years.

- **Active**: volcano that is erupting or showing signs of seismic activity.
- **Dormant**: magma pool is still active; has the ability to erupt someday.
- **Extinct**: volcano no longer has ability to erupt, or is extremely unlikely to erupt (sometimes called a “dead” volcano).

## **Monitoring Volcanoes:**

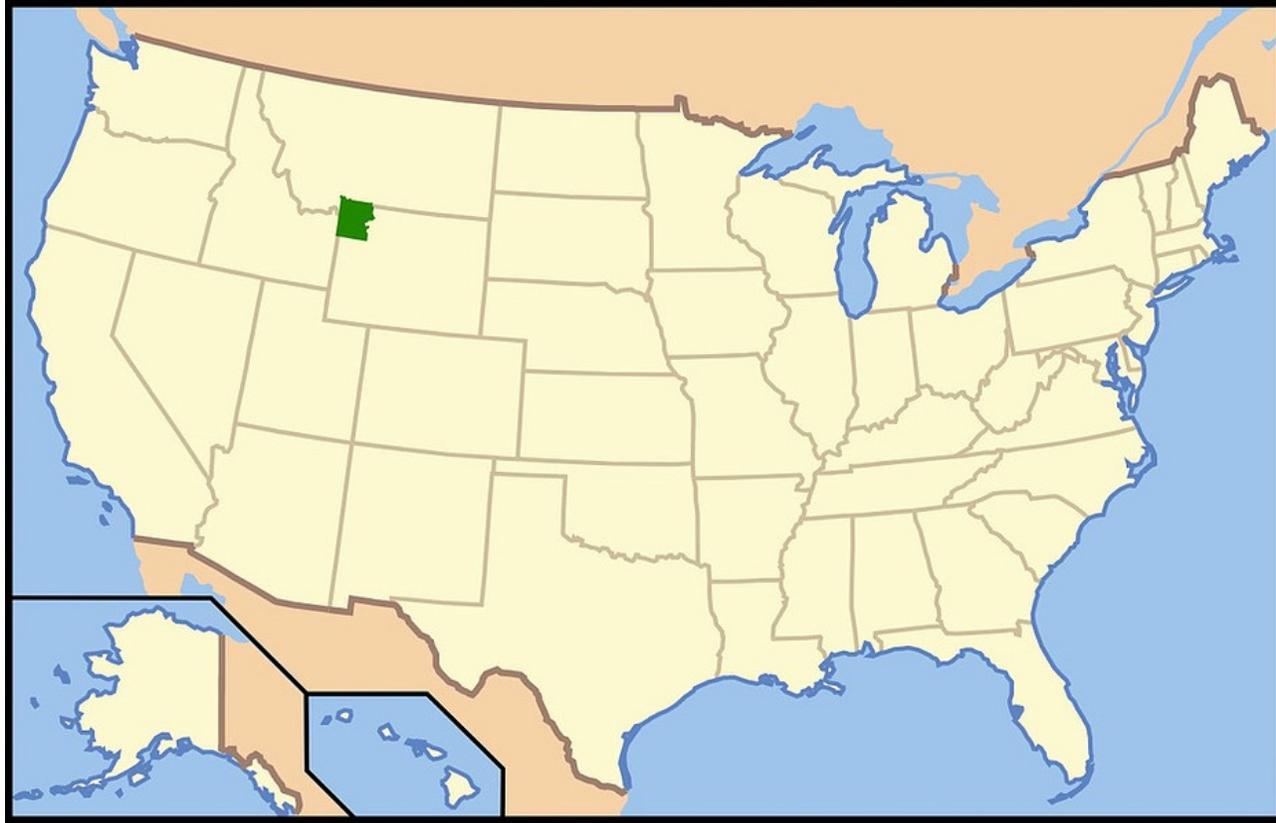
Easier to predict than earthquakes.

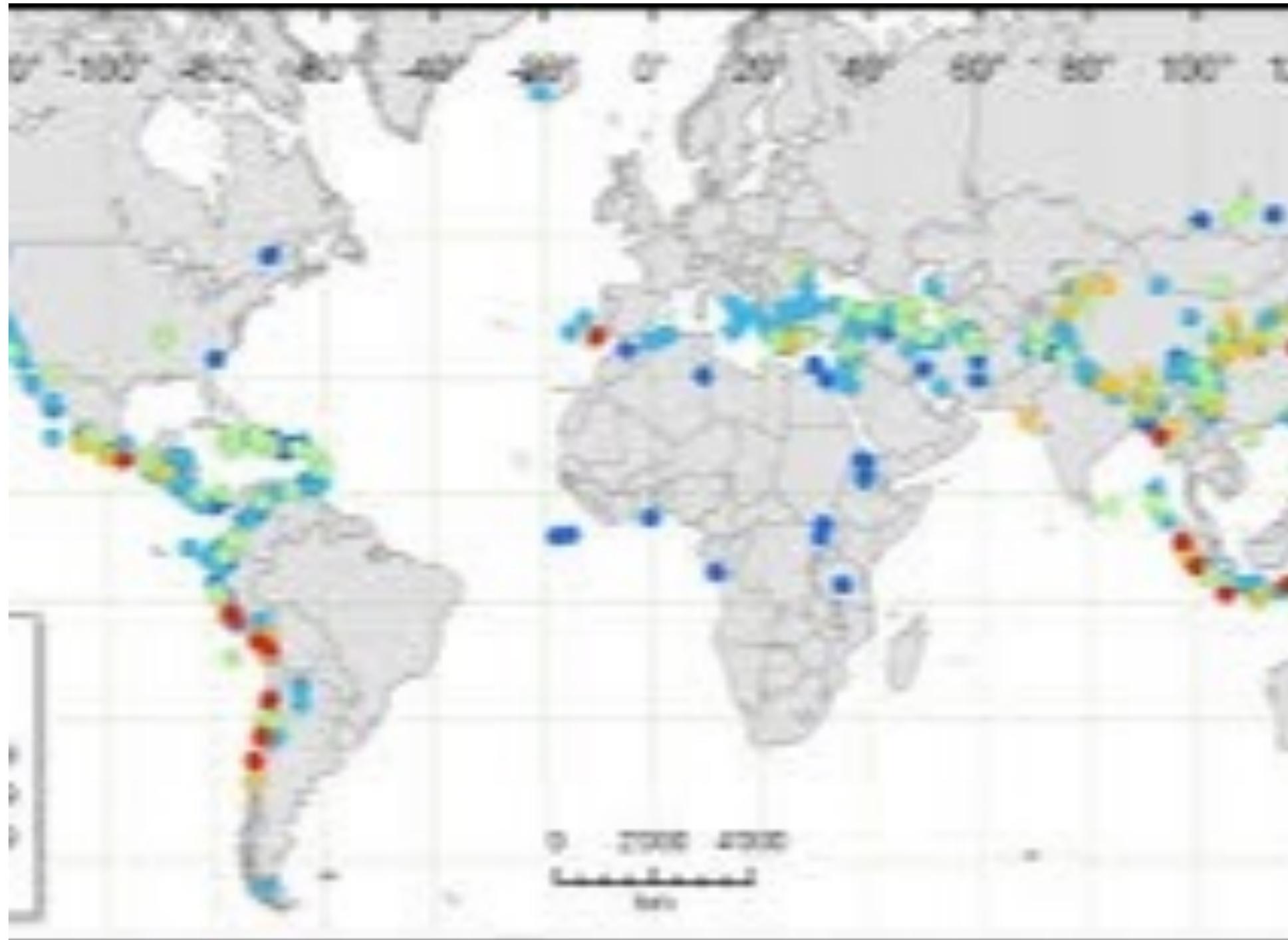
However, hard to predict the force of the eruption.

### Tools/Methods used to predict volcanic activity:

- ✓ Seismographs → detect vibrations.
- ✓ Tiltmeters, lasers → detect changes in surface (slight bulging of a mountain as nears eruption).
- ✓ Monitor gases escaping from volcano.
- ✓ Temperature changes in underground water, hot springs, etc.

# Yellowstone National Park





# Today's "Plan" — Wednesday January 4, 2023

1. Attendance/Brain Stretcher
2. Significant Volcanoes in our history
3. Unit Pre-Test
4. ***Continue Inside Earth Project***

## Today's Learning Objectives:

Identify key events in our Earth's history (Geologic Time Scale).

## Today's "Plan" — Thursday January 5, 2023

1. Attendance/Brain Stretcher
2. A little more about Mt. St. Helens
3. Virtual Lab on Plate Boundaries
- 4. *Continue/Finish Inside Earth Project***

### Today's Learning Objectives:

Identify different types of plate boundaries.

## Today's "Plan" — Freyday January 6, 2023

1. Attendance/Brain Stretcher
2. Submitting Virtual Lab from yesterday
3. View some Inside Earth Projects
- 4. *Finish Inside Earth Project! These will be turned in at the end of class today***
- 5. *Kahoot over Volcanoes & Earthquakes***

### Today's Learning

#### Objectives:

Identify key characteristics of the Earth's structure, earthquakes, or volcanoes  
*(meaning finish your Inside Earth Project!)*

## Today's "Plan" — Monday January 9, 2023

1. Attendance/Brain Stretcher
2. View some more Inside Earth Projects
3. Video: Plate Tectonics
4. Mapping Activity—How Do Scientists Determine the Earth's Plates?
5. Pd 5 & 6: Kahoot over Volcanoes & Earthquakes (Periods 2 & 3 did this Friday)

### Today's Learning Objectives:

- How do we determine where the Earth's plates are?

## Today's "Plan"—Tuesday January 10, 2023

1. Attendance/Brain Stretcher
2. View some more Inside Earth Projects
3. Quiz over Mapping
4. Brief History of the Earth

### *If time:*

5. Pd 5 & 6: Kahoot over Volcanoes & Earthquakes (Periods 2 & 3 did this Friday)
6. Pd 2 & 3: Vocab Kahoot

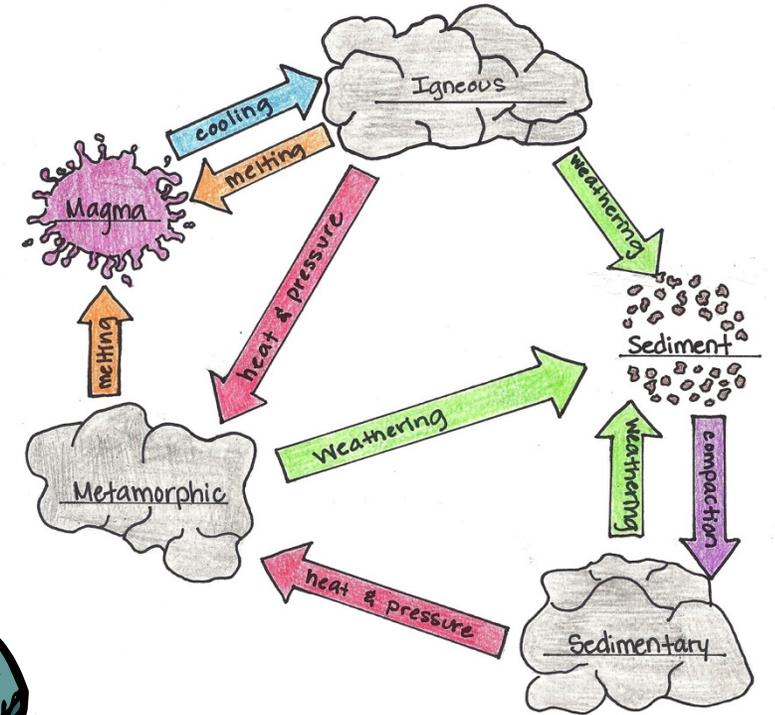
### Today's Learning Objectives:

- How do we determine where the Earth's plates are?

# Quick History of the Earth



## The Rock Cycle



## Overview of the Universe:

- There are numerous theories on the history and formation of the universe and Earth, including different scientific theories as well as religious, spiritual, and philosophical theories.
- What we are going to go over is based on common scientific theory.

## Terminology:

- Universe: “Everything”; never ending
  - Currently estimated at 13.8 billion years old
- Galaxy: clusters of millions/billions stars held together by gravity
- Solar system: group of planets, moons, asteroids, comets, etc. that revolve around a star



# **4 Eras of Earth's History:**

## 1. Precambrian Era

- 4.6 billion years ago → 540 million years ago
- Lasted over 4 billion years
- Earth formed. Lava/magma cooled, Earth's surface began to develop.
- Bacteria main life form.
- Oxygen levels increased.
- Large ice age at end, most life became extinct.

## 2. Paleozoic Era

- 540 mya → 245 mya (total of 295 million years).
- Oceans covered most of Earth.
- Continents in Southern Hemisphere at this time.
- Warmer climate.
- Lots of marine (ocean) life (ex: trilobite, coral, snails, clams, fish)
- Early land life develops—amphibians, insects, first reptiles
- Large tropical-type forests → later became coal.
- Pangaea formed near end of era.
- Large mass extinction at end → 90% of all life extinct.



### 3. Mesozoic Era (Age of Reptiles)

- 245 mya to 65 mya (lasted 180 million years).
- Pangaea breaks up.
- Large mountain ranges form (ex: Andes in South America, the Rockies in N. America).
- Warm climate, abundant plant life.
- Dinosaurs appear (plant-eating herbivores first, then meat-eating carnivores).
- First large flying animals (up to 42 feet wingspan).
- Large meteorite hits → another mass extinction.

## 4. Cenozoic Era

- 65 million years ago → today
- Began periods of warm, then ice ages.
- At one point,  $\frac{1}{4}$  of all land covered in ice.
- 11,000 years ago, last ice age ended.
- During this period, mammals become dominant.
- Humans appear towards the end of this era (within last 200,000 years).



# Today's "Plan" — Wednesday January 11, 2023

1. Attendance/Brain Stretcher
- 2. 2, 3, & 6<sup>th</sup> periods**
  1. Era sketches
  2. History of the Earth Project
- 3. 5<sup>th</sup> pd:**
  1. Quiz over Mapping
  2. Kahoot over Volcanoes & Earthquakes
  3. Finish Era sketches
  4. History of the Earth Project

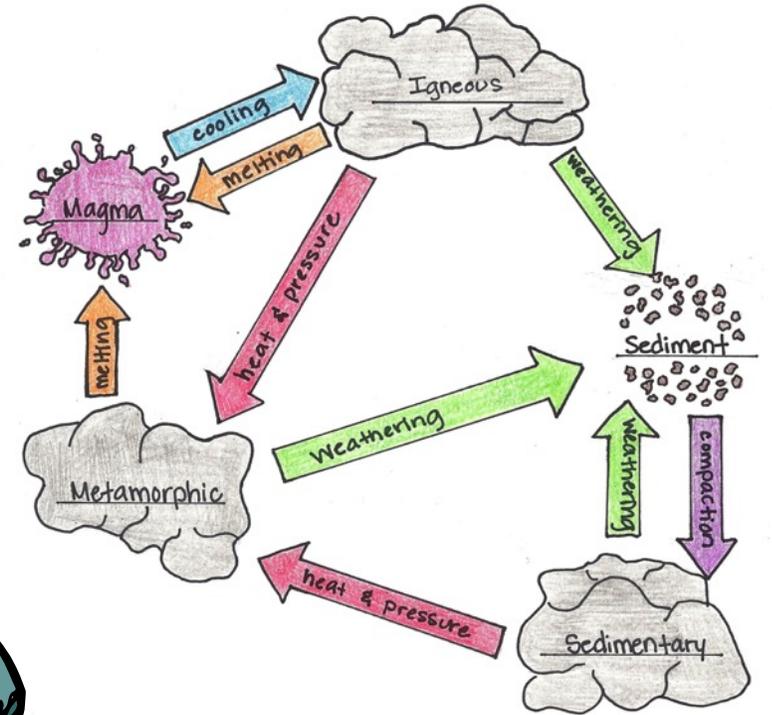
## Today's Learning Objectives:

- What were some key events from the 4 eras of the Earth's history?

# Unit 7: Inside Earth



## The Rock Cycle



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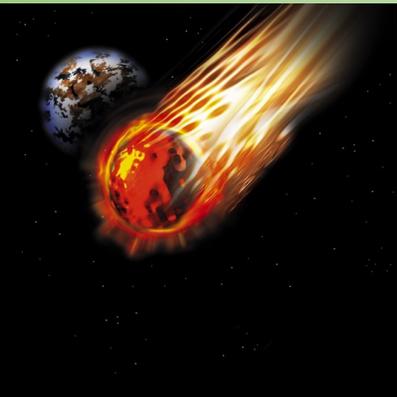
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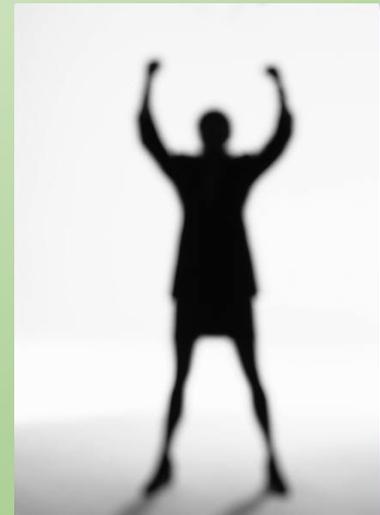
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## 4. Cenozoic Era

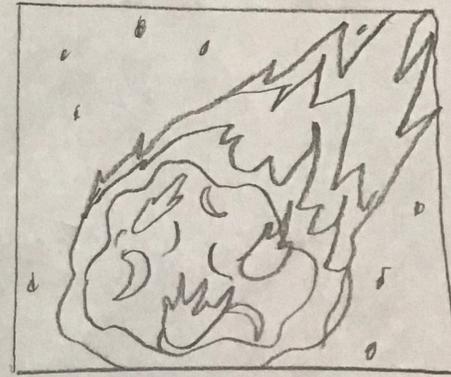
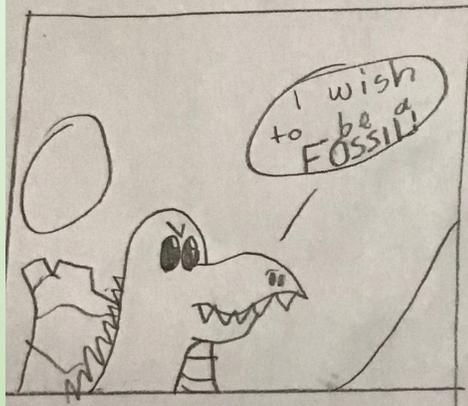
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# **Earth's History Project:**

Here are a few options, or maybe you can come up with a better idea.

- Make a comic showing each of the 4 Eras, ***showing what YOU think the*** Earth might have looked like during that era and the types of life present. Think of it like you travelled there briefly in a time machine, and you are picturing what you saw.
- Construct something that gives a brief explanation of each of the Eras, explaining:
  - the time period each era covered
  - types of life present
  - the climate of the Earth
  - significant events of that era
- Create a timeline of the significant types of life as they developed throughout the eras.
- Do you have a better idea?



The end

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# The Geologic Time Scale:

How do scientists gather info on Earth's past?

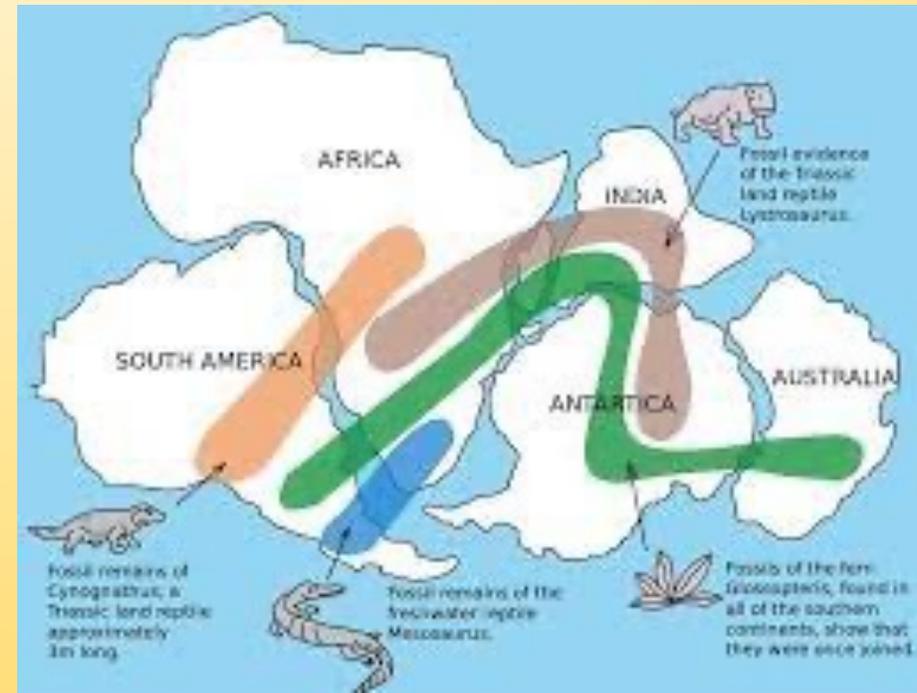
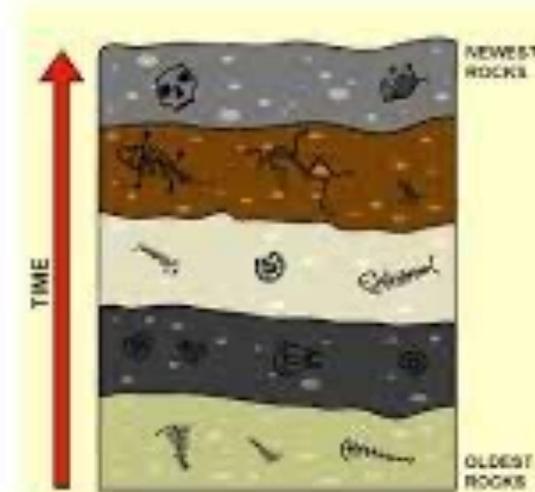
## **1. Relative dating/Law of Superposition**

The deeper things are found within the Earth, the longer time ago they existed.

## **2. Comparing Fossils (plants & animals)**

## **3. Radioactive Dating/Absolute Dating**

### Example of Superposition

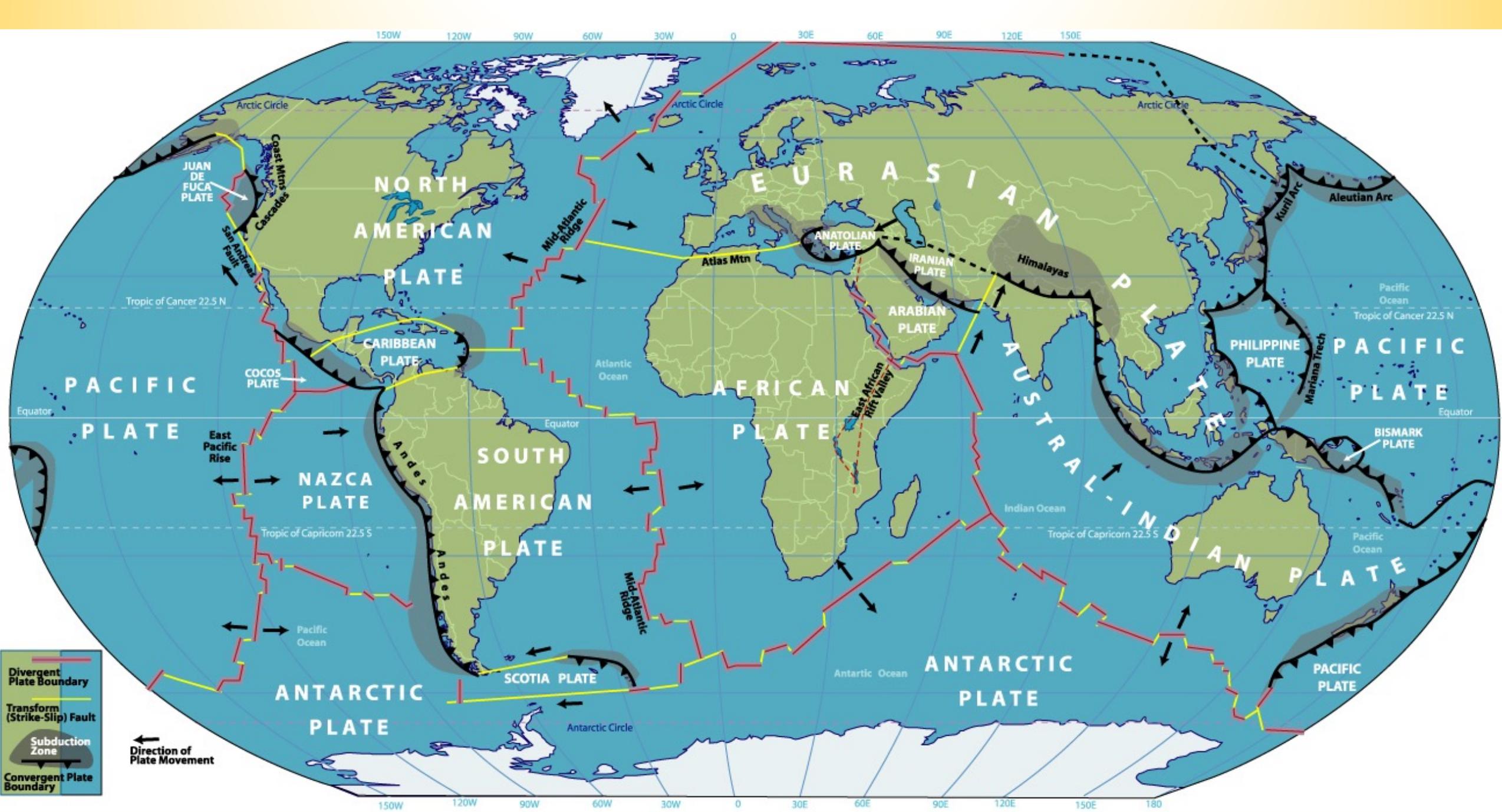


## **Radioactive Dating:**

Scientists can use certain radioactive elements to get the approximate age of certain things (fossils, rocks, etc.).

Radioactive elements have certain “half-lives”, which is the time it takes for half of that element to decay into another element.

Ex:    Cesium-134 (Cs-134) = 2.062 years  
      Cesium-138 (Cs-138) = 32.2 minutes  
      Carbon-14 (C-14)       = 5730 years  
      Plutonium-239 (Pu-239) = 24,065 years  
      Uranium-234 (U-234) = 244,500 years  
      Uranium-238 (U-238) = 4,470,000,000 years



**Divergent Plate Boundary**

**Transform (Strike-Slip) Fault**

**Subduction Zone**

**Convergent Plate Boundary**

**Direction of Plate Movement**

# Today's "Plan" — Thursday January 12, 2023

1. Attendance/Brain Stretcher
2. How do scientists gather information on the Earth's past?
3. Lab: Radioactive Dating/Absolute Dating

## Today's Learning Objectives:

- How do scientists use math to determine the ages of fossils?

# The Geologic Time Scale:

How do scientists gather info on Earth's past?

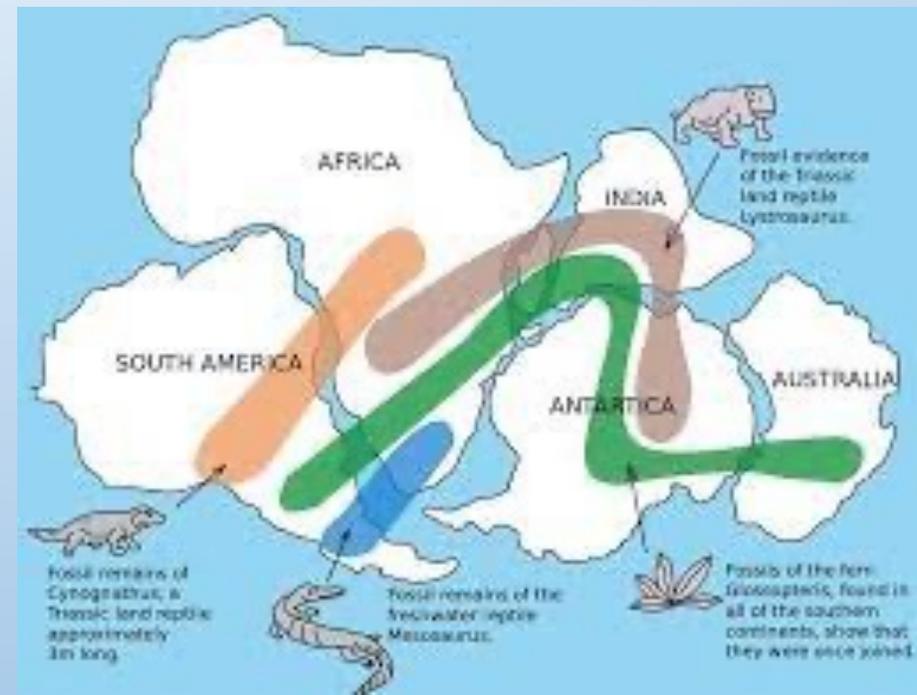
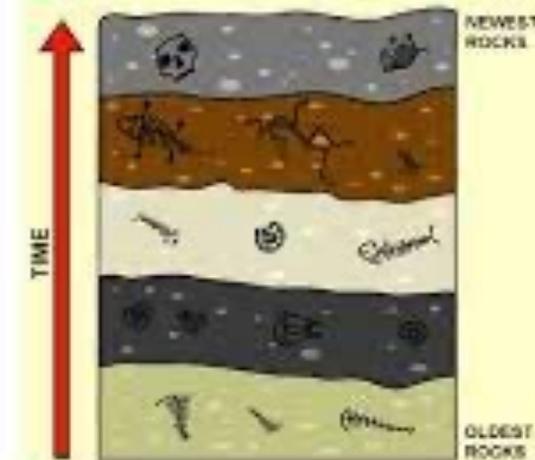
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2. How do scientists gather information on the Earth's past?
3. Lab: Radioactive Dating/Absolute Dating

## Today's Learning Objectives:

- What are key things from each of the Earth's eras in the Geologic Time Scale?

# Today's "Plan" — Freyday January 13, 2023

1. Attendance/Brain Stretcher
2. Go over the answer to yesterday's Brain Stretcher
3. How do scientists gather information on the Earth's past?
4. Lab: Radioactive Dating/Absolute Dating

## Today's Learning Objectives:

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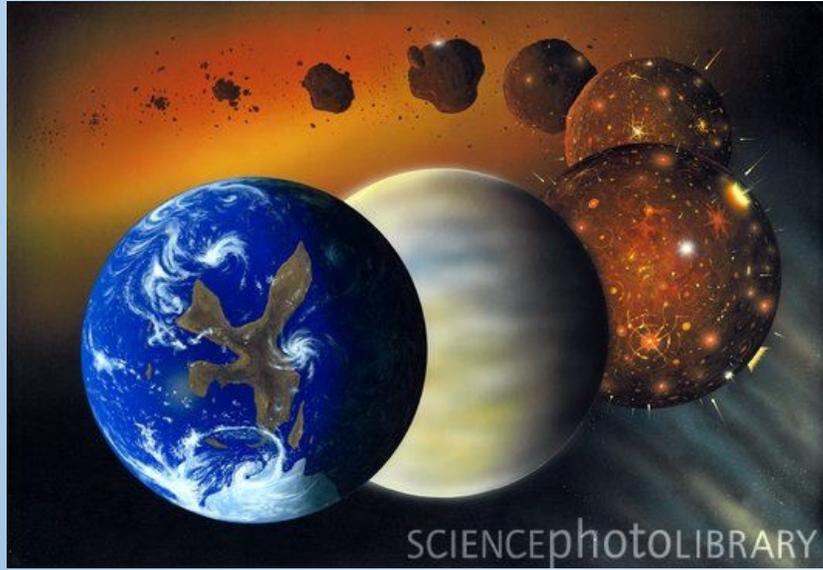
## Today's "Plan" — Freyday January 13, 2023

1. Attendance/Brain Stretcher
2. Explanation of yesterday's Brain Stretcher
3. Schoology Quiz: **Earth's History Quiz**
  1. Use the information from esteparksteam.com titled **Earth's History Project** or **Espanol Historia de la Tierra**
4. Continue working on Earth's History Project
  1. Have key events from each era
  2. Be creative!

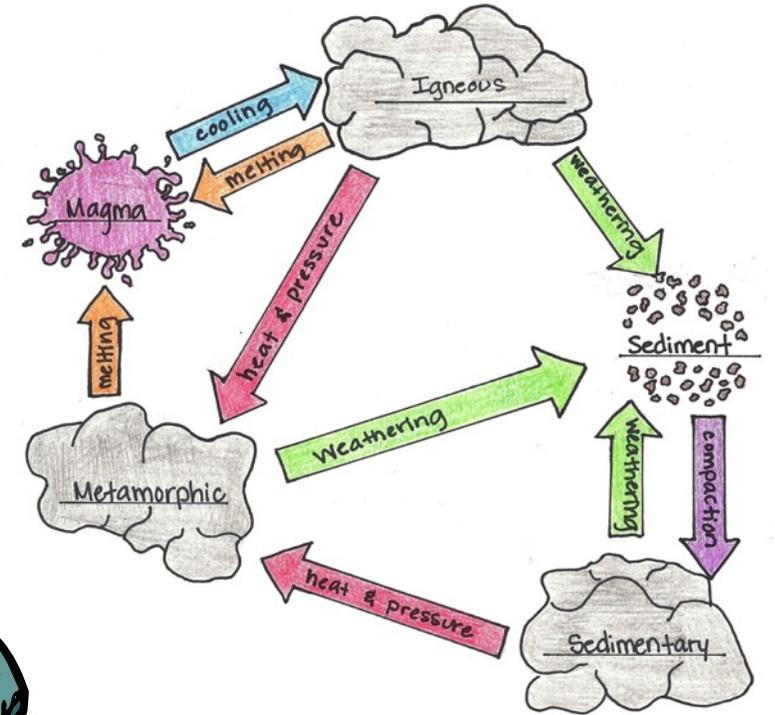
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# Unit 7: Inside Earth



## The Rock Cycle



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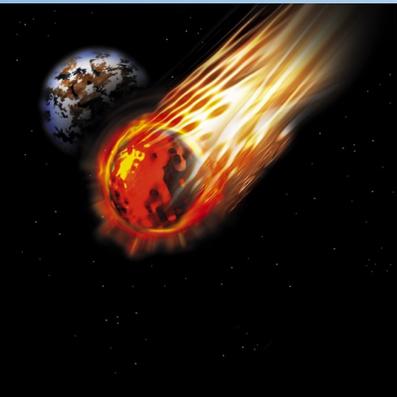
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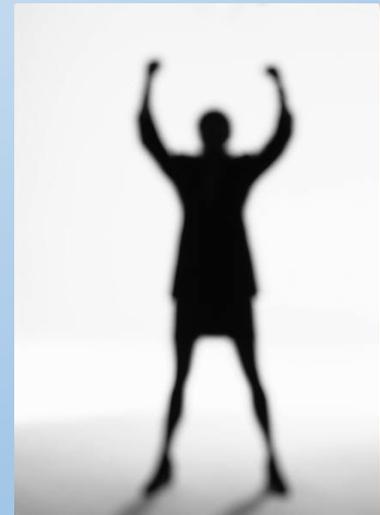
### 3. Mesozoic Era (Age of Reptiles)

- 245 mya to 65 mya (lasted 180 million years).
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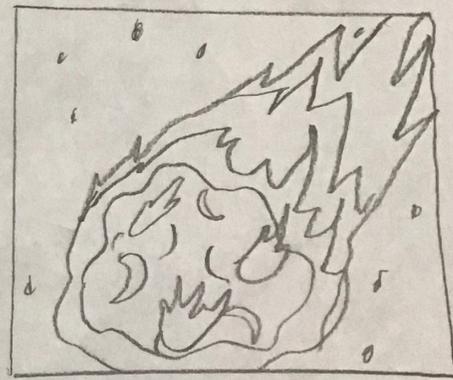
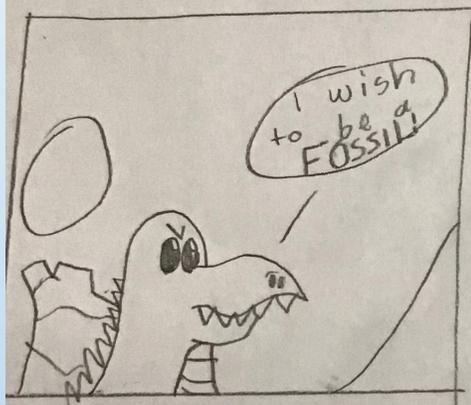
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# **Earth's History Project:**

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  - types of life present
  - the climate of the Earth
  - significant events of that era
- Create a timeline of the significant types of life as they developed throughout the eras.
- Do you have a better idea?



The end

# Today's "Plan"—Tuesday January 17, 2023

1. Attendance/Brain Stretcher
2. Begin "Ice Age Death Trap"
3. Continue working on Earth's History Project
  1. Have key events from each era
  2. Be creative!

## Today's Learning Objectives:

- How do scientists learn about the Earth's past?

# Today's "Plan" — Thursday January 19, 2023

1. Attendance/Brain Stretcher
2. Begin "Ice Age Death Trap"
3. Continue/Finish working on Earth's History Project
  1. Have key events from each era
  2. Be creative!

## Today's Learning Objectives:

- How do scientists learn about the Earth's past?

## Today's "Plan" — Freyday January 20, 2023

1. Attendance/Brain Stretcher
2. Continue "Ice Age Death Trap"
3. Finish working on Earth's History Project
  1. Have key events from each era
  2. **These will be turned in at the end of class today!**
4. Blooket for those who are done

### Today's Learning Objectives:

- How do scientists learn about the Earth's past?

# Today's "Plan"—Monday January 23, 2023

1. Attendance/Brain Stretcher
2. Look at some 4 Eras Projects
3. Finish "Ice Age Death Trap"
4. Blooket (if time)

## Today's Learning Objectives:

- How do scientists learn about the Earth's past?

# *Ice Age Death Trap*

- 1) elephant / elefante
- 2) 100,000 years / 100.000 años
- 3) Snowmass, Colorado
- 4) October 2010 / Octubre 2010
- 5) Building dam, lake for water supply / Construcción de presa, lago para suministro de agua
- 6) 30 feet deep; 150,000 years / 30 pies de profundidad; 150.000 años
- 7) glaciers / glaciares
- 8) 6-8 feet / 6-8 pies
- 9) a wobble in the way the Earth spins, which changes the way sunlight hits the Earth / un bamboleo en la forma en que gira la Tierra, lo que cambia la forma en que la luz del sol incide sobre la Tierra
- 10) 5 tons / 5 toneladas

11)twice as big / el doble de grande

12)saber-tooth cat / gato dientes de sable

13)13 feet tall; 12 feet tusks / 13 pies de altura; colmillos de 12 pies

14)very young or weak mammoths / mamuts muy jóvenes o débiles

15)Dire wolf / Lobo terrible

16)some were still green / algunos todavía estaban verdes

17)36

18)50 days / 50 días

19)grizzly bear / oso pardo

20)mammoths and mastodons / mamuts y mastodontes

21)mastodons / mastodontes

22)it was warmer than today / hacia más calor que hoy

23)quicksand / arenas movedizas

24)shake-kill; shake-bury / sacudir-matar; sacudir-enterrar

Some common animals from this time period:

- mammoth, giant bison, sloth, deer, camel, saber-tooth cat, short-face bear, Dire wolf
- mamut, bison gigante, perezoso, venado, camello, gato dientes de sable, oso de cara corta, lobo temible

- 25) 7 times every 100,000 years / 7 veces cada 100.000 años
- 26) layers or rings, just like rings on a tree / capas, anillos, como anillos en un árbol
- 27) scavengers / carroñeros
- 28) several weeks / varias semanas
- 29) 13,000 years / 13.000 años
- 30) 4,000 pounds; months / 4,000 libras; meses
- 31) claims; proof / reclamaciones; prueba
- 32) stone tools / herramientas de piedra
- 33) plaster jacket / chaqueta de yeso
- 34) over 4,000 / más de 4.000
- 35) dating the clay it was in / fechando la arcilla en la que estaba

# **Earth's History Project:**

Here are a few options, or maybe you can come up with a better idea.

- Make a comic showing each of the 4 Eras, ***showing what YOU think the*** Earth might have looked like during that era and the types of life present. Think of it like you travelled there briefly in a time machine, and you are picturing what you saw.
- Construct something that gives a brief explanation of each of the Eras, explaining:
  - the time period each era covered
  - types of life present
  - the climate of the Earth
  - significant events of that era
- Create a timeline of the significant types of life as they developed throughout the eras.
- Do you have a better idea?

## Today's "Plan"—Tuesday January 24, 2023

1. Attendance/Brain Stretcher
2. Close out all unneeded apps/Safari tabs
3. Forms of Energy

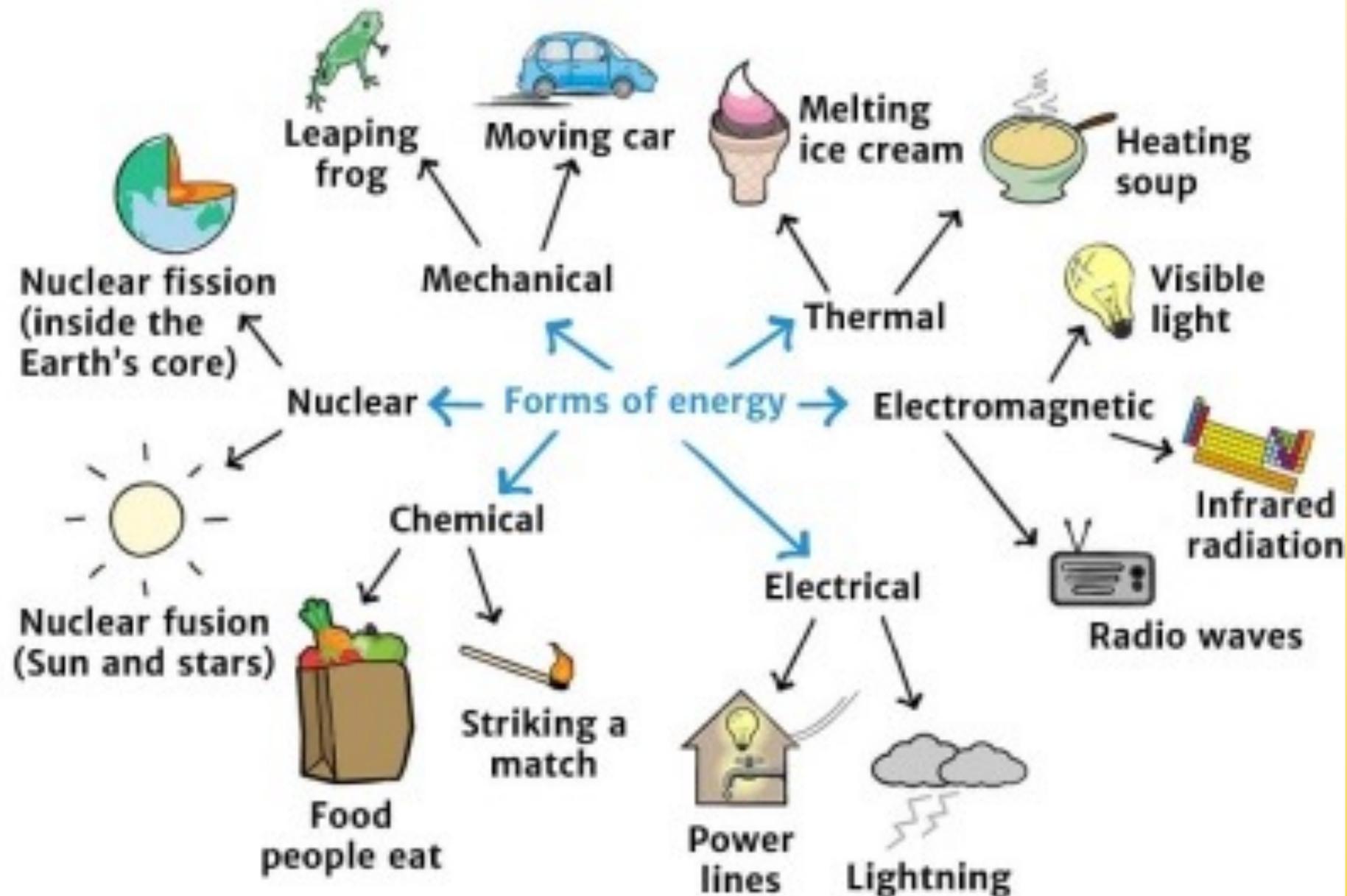
### Today's Learning Objectives:

- What are the main types of energy?

# *Forms of Energy*

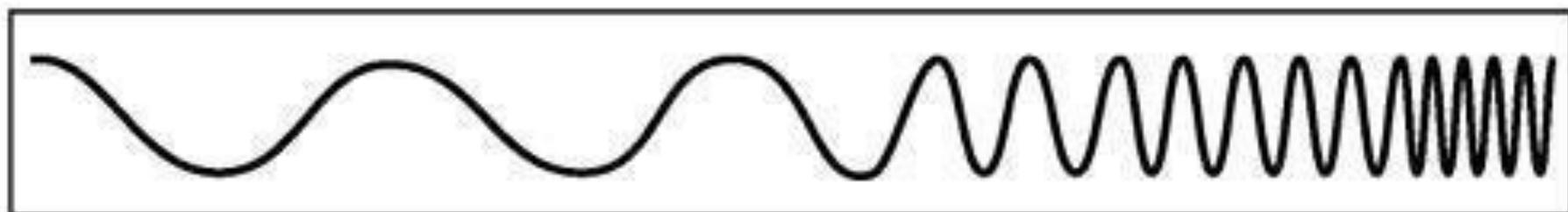
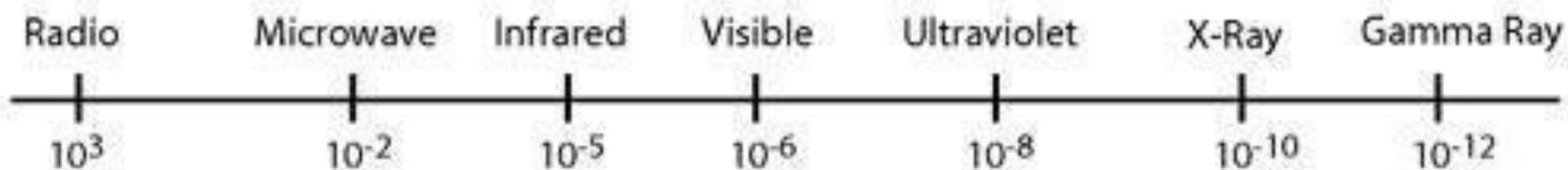
- Mechanical (Motion) Energy
- Chemical Energy
- Electrical Energy
- Thermal Energy
- Nuclear Energy
- Gravitational Energy
- Electromagnetic/Light Energy
- Sound Energy

# Types of Energy

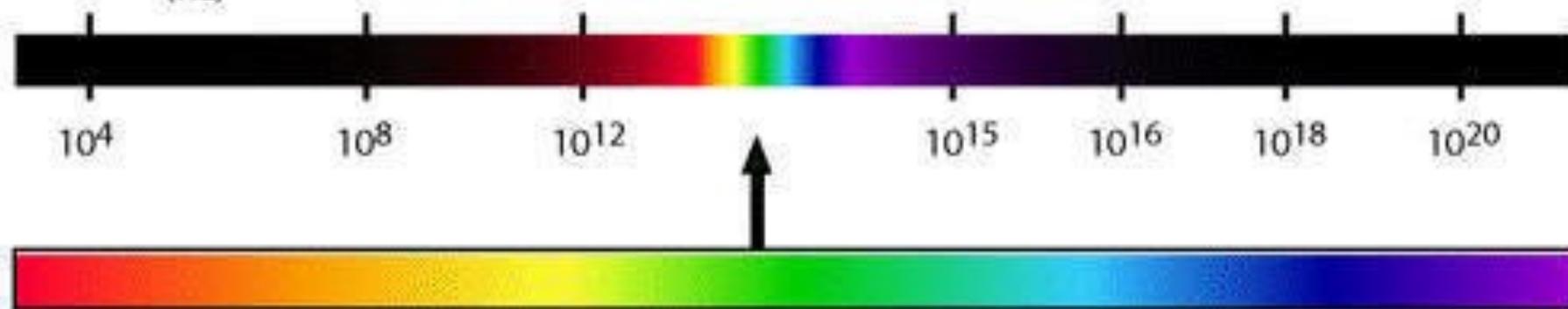


# THE ELECTRO MAGNETIC SPECTRUM

Wavelength  
(metres)



Frequency  
(Hz)



# Forms of Energy

Energy Type

Definition

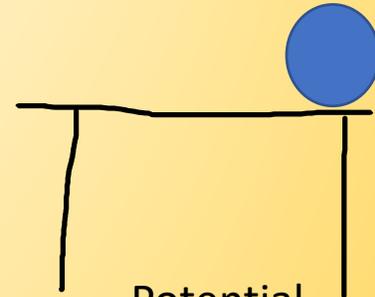
Picture/Sketch

Mechanical

Energy from an object in motion (kinetic) or from its position (potential).



Kinetic  
Energy



Potential  
Energy

# *Formas de Energía*

- Energía Mecánica
- Energía Química
- Energía Eléctrica
- Energía Termal
- Energía Nuclear
- Energía Gravitacional
- Energía Electromagnética/Luz
- Energía de Sonido

# Forms of Energy

Tipo de energía

Definición

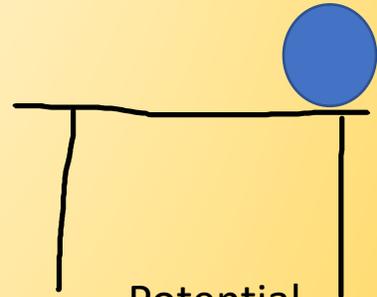
Bosquejo

Energía  
Mecánica

Energía de un objeto en movimiento (cinética)  
o de su posición (potencial).

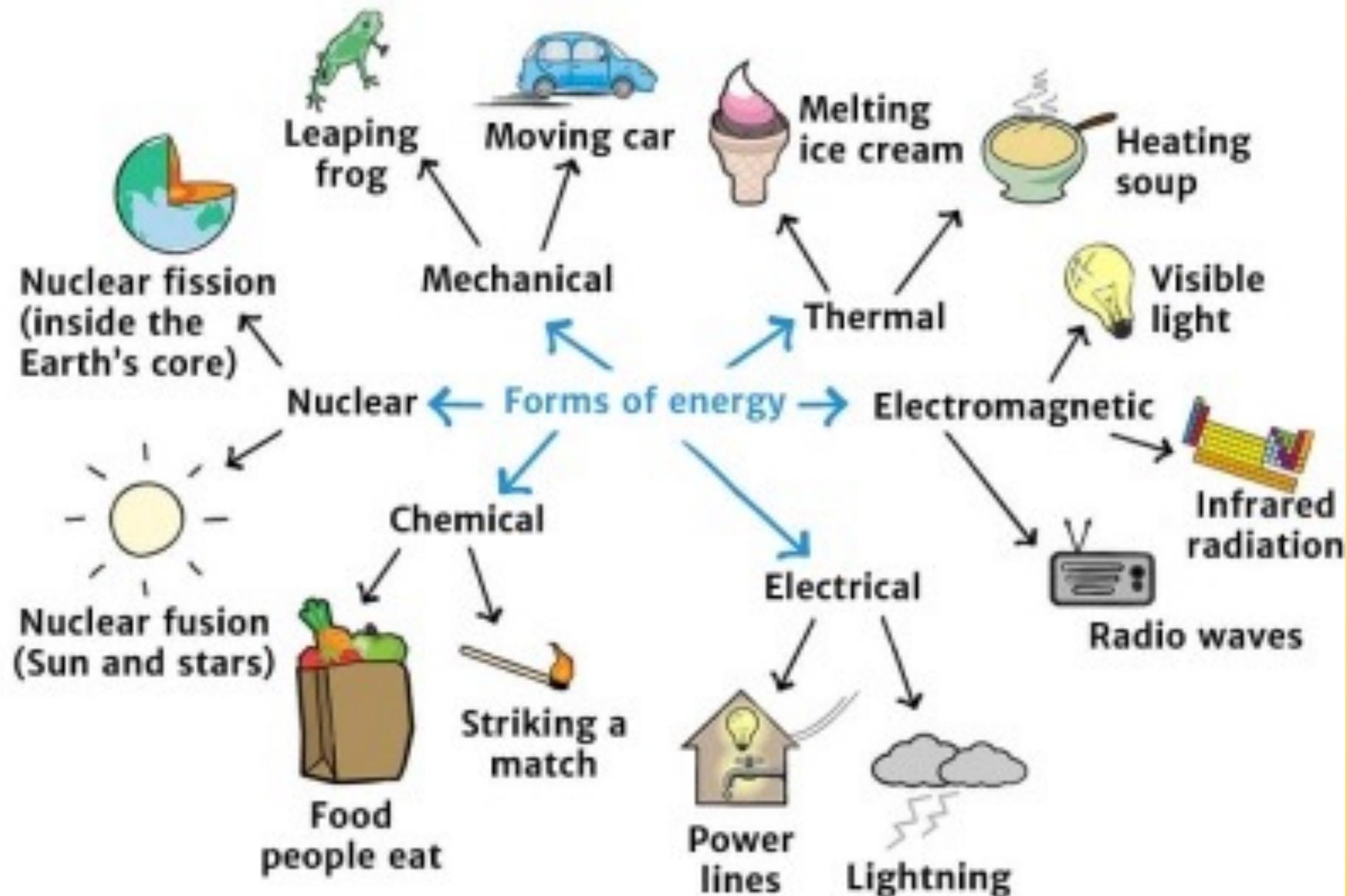


Kinetic  
Energy



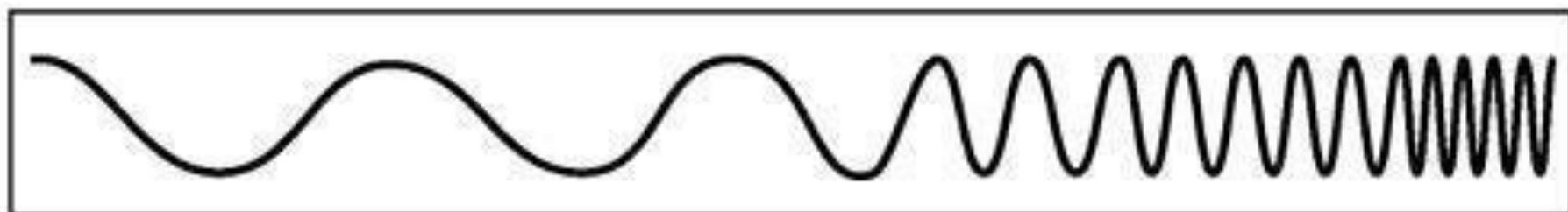
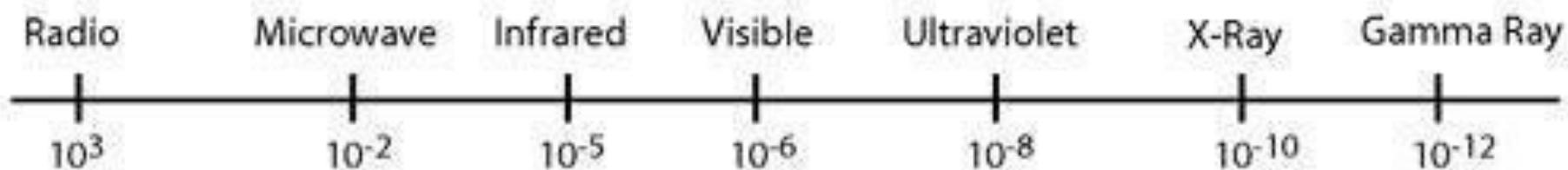
Potential  
Energy

# Types of Energy

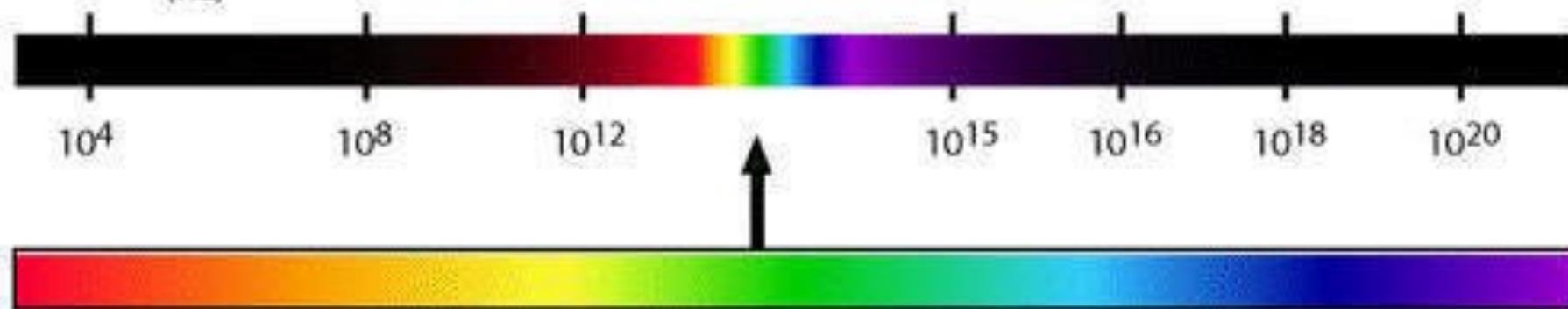


# THE ELECTRO MAGNETIC SPECTRUM

Wavelength  
(metres)



Frequency  
(Hz)



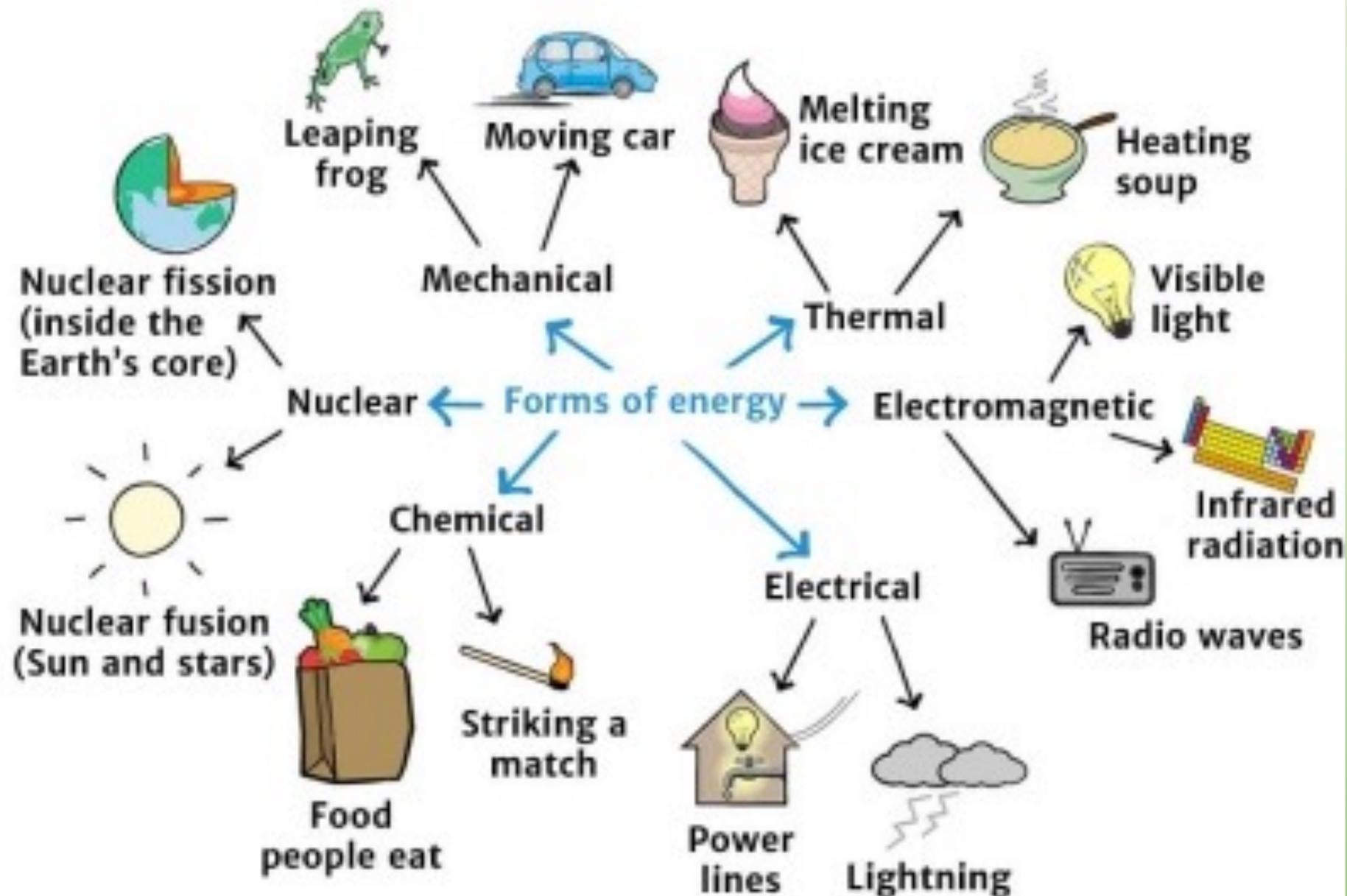
## Today's "Plan" — Wednesday January 25, 2023

1. Attendance
2. Reminder: Science MAP is Thursday
  1. Bring book for after test—just like any other standardized test
3. Blookey Brain Stretcher
4. Lab & Demos
5. If time, finish ***Forms of Energy*** assignment from yesterday

### Today's Learning Objectives:

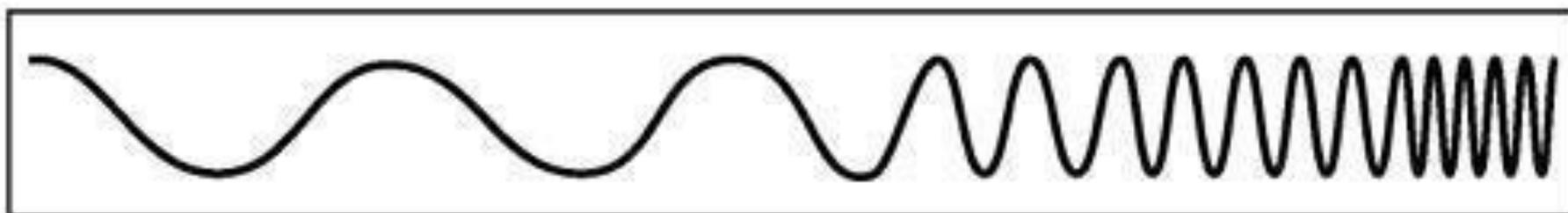
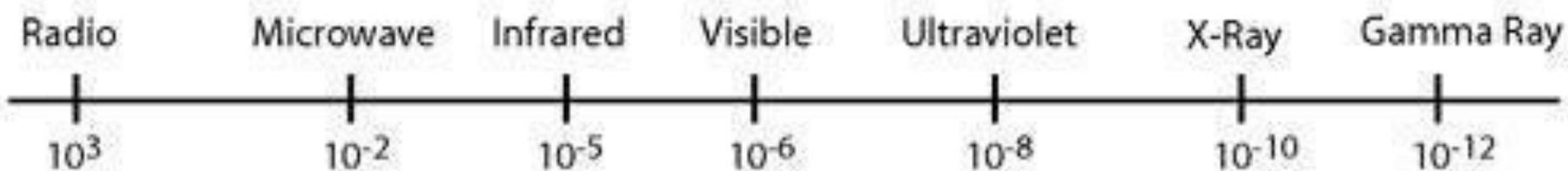
- What are the main types of energy?

# Types of Energy

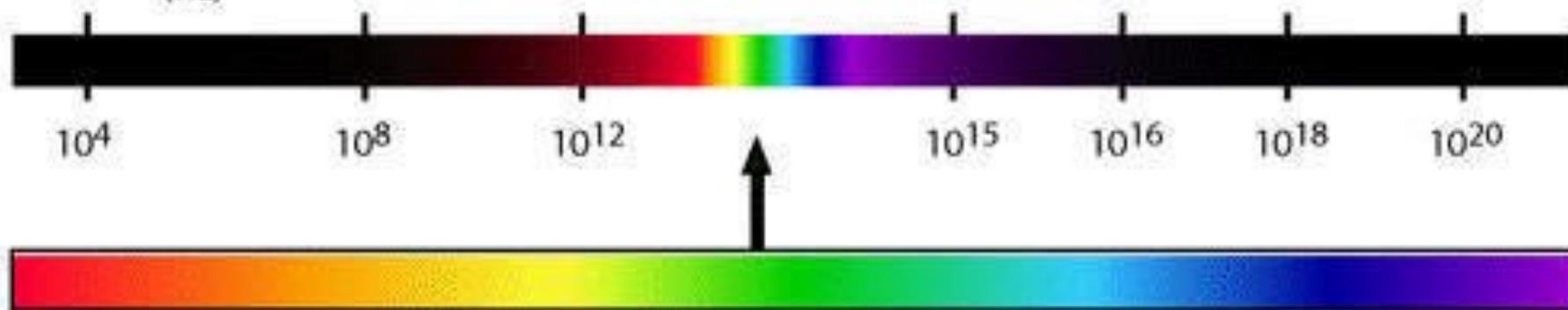


# THE ELECTRO MAGNETIC SPECTRUM

Wavelength  
(metres)



Frequency  
(Hz)



# Forms of Energy

- Mechanical (Motion) Energy
- Chemical Energy
- Electrical Energy
- Thermal Energy
- Nuclear Energy
- Gravitational Energy
- Electromagnetic/Light Energy
- Sound Energy

# Formas de Energía

- Energía Mecánica
- Energía Química
- Energía Eléctrica
- Energía Termal
- Energía Nuclear
- Energía Gravitacional
- Energía Electromagnética/Luz
- Energía de Sonido

## Energy Demos

1. Which type of energy is involved in this demonstration?
2. Which type of light (electromagnetic) energy is the thermometer detecting?
3. Explain why we get different temperature readings from the white paper than we do from the black paper?
4. You have probably talked about primary colors in art (red, yellow, blue), which can then make the secondary colors (orange, green, purple). But can that work in reverse—could you use the secondary colors to make primary colors (such as orange and green making yellow)?
5. Explain one difference between sound waves and light waves.

## Today's "Plan" — Thursday January 26, 2023

1. Attendance
2. Close out all apps, then flip 'em flat
3. When finished with the test, READ or REST  
QUIETLY
4. Don't ask to leave the room unless it is some  
sort of emergency!
5. Session Name: Sci
6. Password: 9226

### Today's Learning Objectives:

- What are the main types of energy?

## Today's "Plan" — Freyday January 27, 2023

1. Attendance/Brain Stretcher
2. Close out all apps, then flip 'em flat
3. Who needs to finish MAP testing?
4. Go over Rube Goldberg devices
5. Finish ***Forms of Energy***
6. Start sketching a Rube Goldberg device

### Today's Learning Objectives:

- What are the main types of energy?

# Forms of Energy

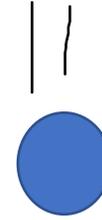
Energy Type

Definition

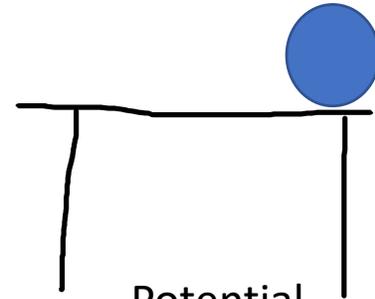
Picture/Sketch

Mechanical

Energy from an object in motion (kinetic) or from its position (potential).



Kinetic  
Energy



Potential  
Energy

# Forms of Energy

Tipo de energía

Definición

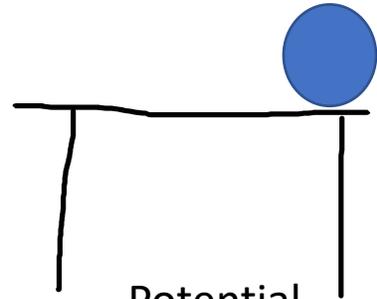
Bosquejo

Energía  
Mecánica

Energía de un objeto en movimiento (cinética)  
o de su posición (potencial).



Kinetic  
Energy



Potential  
Energy

# Today's "Plan"—Monday January 30, 2023

1. Attendance/Brain Stretcher
2. Review Wednesday's demos.
3. More on Rube Goldberg devices
4. Finish ***Forms of Energy***
5. Sketch a Rube Goldberg device

## Today's Learning Objectives:

- What are the main types of energy?

# *Rube Goldberg Sketches*

- Have a basic ending task—what is the purpose of this machine?
- Have at least 10 energy transfers.
- For each step/energy transfer, have a brief written description of what is occurring.
- Try to include some scientific terms, such as naming simple machines or naming forms of energy, etc.

# *Rube Goldberg Sketches*

- Tenga una tarea final básica: ¿cuál es el propósito de esta máquina?
- Tenga al menos 10 transferencias de energía. Para cada paso/transferencia de energía, tenga una breve descripción escrita de lo que está ocurriendo.
- Trate de incluir algunos términos científicos, como nombrar máquinas simples o nombrar formas de energía, etc.

