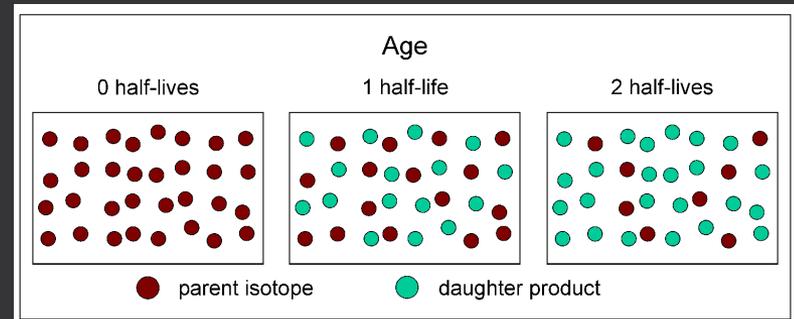
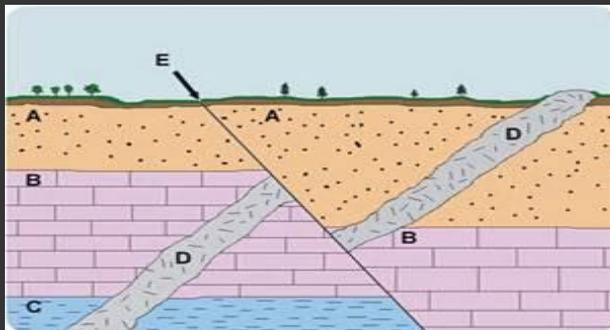


Earth's Evolution & Rock Dating

SC.7.E.6.4 EXPLAIN AND GIVE EXAMPLES OF HOW PHYSICAL EVIDENCE SUPPORTS SCIENTIFIC THEORIES THAT EARTH HAS EVOLVED OVER GEOLOGIC TIME DUE TO NATURAL PROCESSES.

ESSENTIAL QUESTION:

What methods allow scientists to tell the age of rocks and what does this tell us about the Earth's history?



Bellringer

Paleontologists discovered fish fossils in the arid deserts of western Egypt. What does the fossil evidence **most likely** indicate about this area's geologic past?

- a) The desert was once a vast ocean.
- b) A giant ocean wave carrying sea life crashed onto the desert.
- c) Mountains in the region once provided water from snowmelt.
- d) The area was moved from the ocean to the desert by plate tectonics.

I Do Guided Notes

Earth's Evolution Essential Question:

RELATIVE DATING

Relative Dating:

Determining the _____ of past events, but NOT _____ dates.

Law of Superposition:

In horizontal layers of _____ rock, each layer is older than the layer _____ it and younger than the layer _____ it.

Folding: The _____ of rock layers due to _____.

Faulting: The _____ of rock layers by transform fault lines.

ABSOLUTE DATING

Absolute Dating: Finding the approximate age of a rock using the _____ atoms inside them.

Radioactive Dating:

- Certain elements _____ (break down) at certain rates.
(Ex. Carbon 14, Uranium)
- Scientists know how long certain atoms take to decay.
- They compare the amount of atoms _____ to the _____ amount to calculate its age.

EARTH'S AGE

- Using radioactive dating, scientists have identified rock as old as _____ billion years old.
- With this evidence and more, the approximate age of the Earth has been calculated as _____ billion years old.

EARTH'S EVOLUTION

- The Earth's surface has been slowly but _____ changing in all of that time.
- Earth used to be covered by a supercontinent named _____.
 - Evidence: Rock with the same _____ and the same _____ can be found on different continents today.

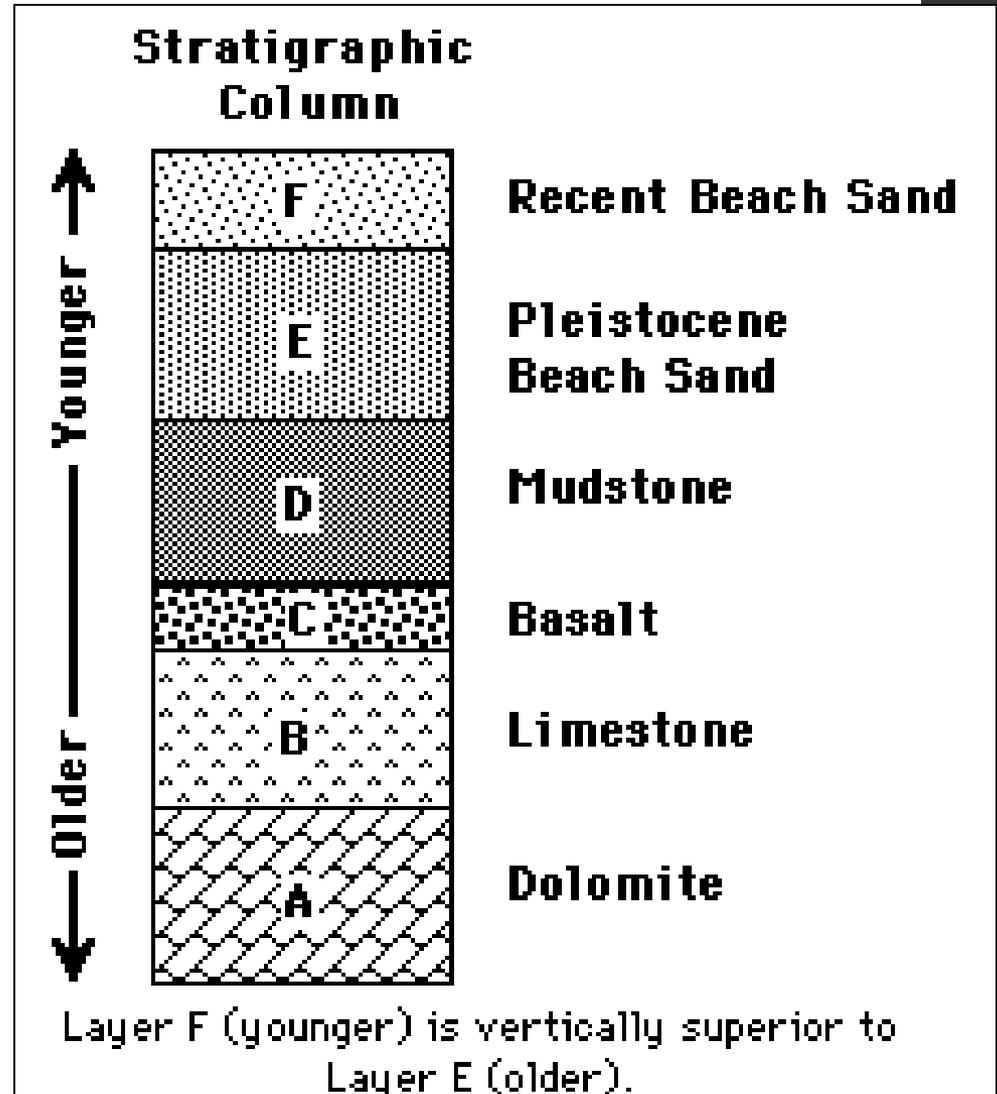
Relative Dating:

Determining the *order* of past events, but **NOT** exact dates.



The Law of Superposition

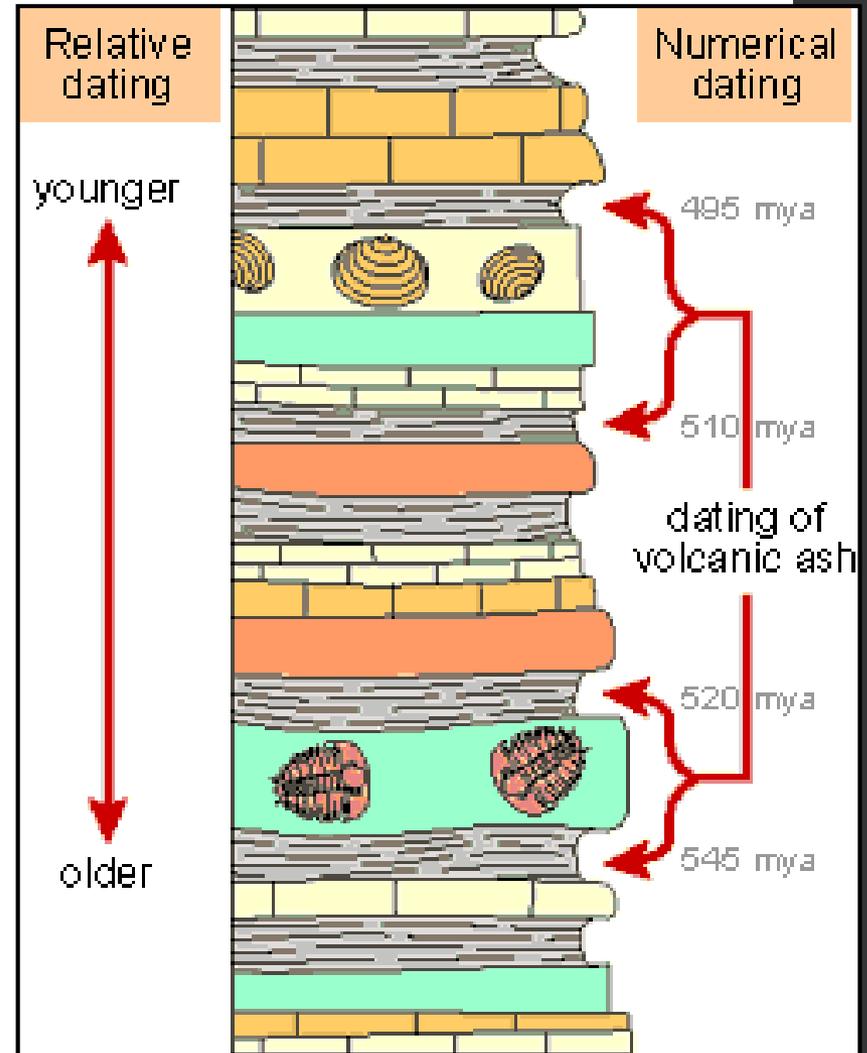
- In horizontal layers of sedimentary rock, each layer is older than the layer above it and younger than the layer below it.



Relative Dating Fossils

Younger fossils will be found in the top layers of rock.

Older fossils will be found in the bottom layers of rock.



Folding:

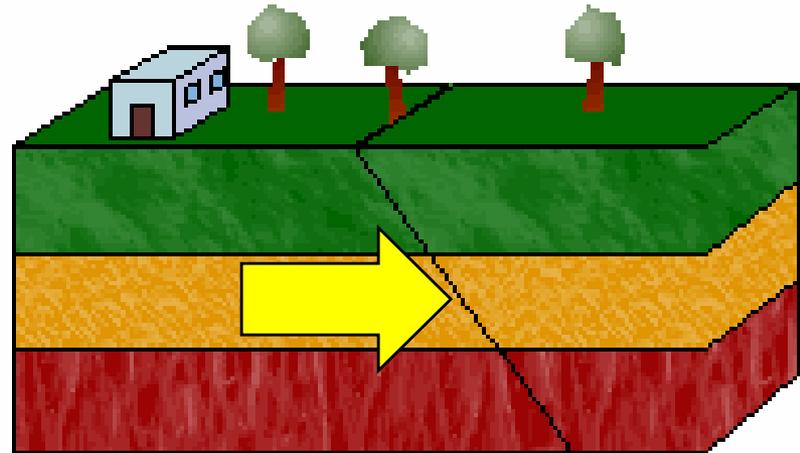
The bending of rock layers due to pressure.



Faulting:

The breaking of rock layers by transform fault lines.

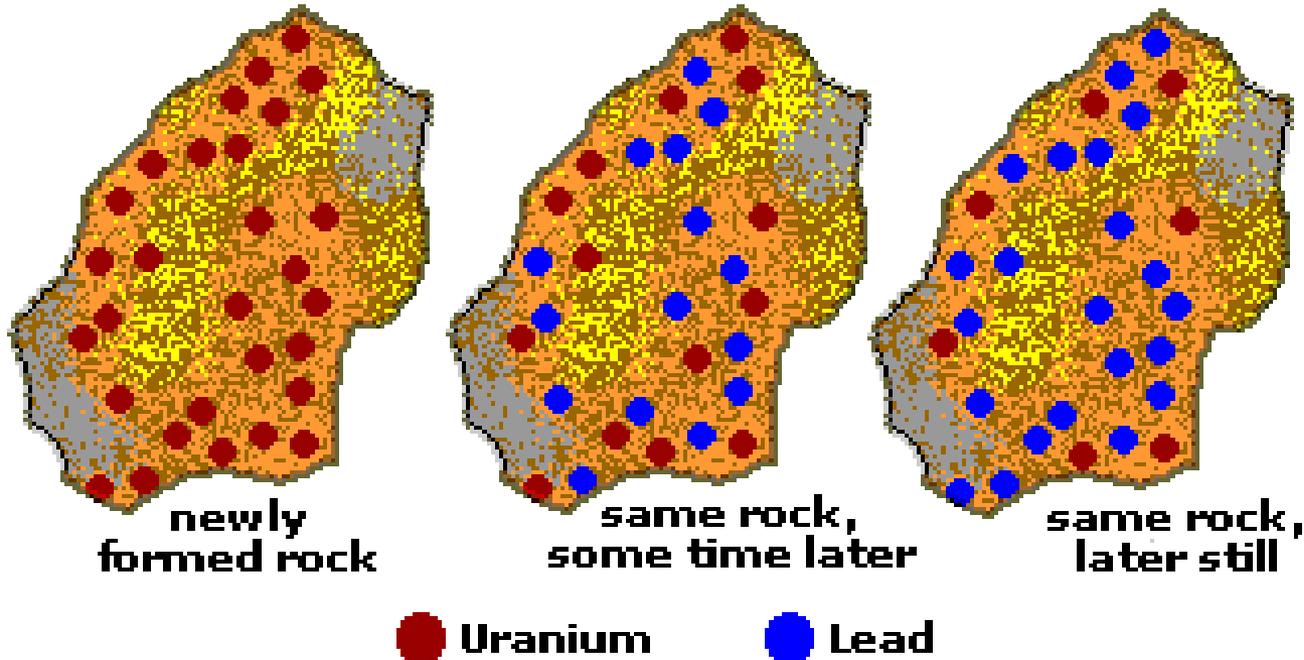
- The arrow shows where a fault line (earthquakes) moved the rock layers.



Absolute Dating:

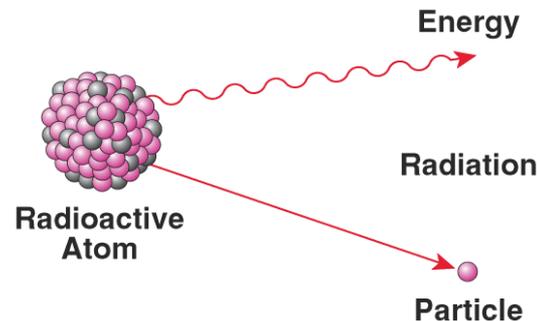
Finding the approximate age of a rock using the radioactive atoms inside them.

Radioactive Age Dating of Rocks



Radioactive Dating

- Certain elements decay (break down) at certain rates.
(Ex. Carbon 14, Uranium)
- Scientists know how long certain atoms take to decay.
- They compare the amount of atoms left to the beginning amount to calculate its age.



Earth's Age



- Using radioactive dating, scientists have identified rock as old as 4.28 billion years old.
- With this evidence and more, the approximate age of the Earth has been calculated as 4.5 billion years old.

Earth's Evolution

- The Earth's surface has been slowly but constantly changing in all of that time.
- Earth used to be covered by a supercontinent named Pangea.
 - Evidence: Rock with the same composition and the same age can be found on different continents today.



WE DO Collaborative Activity

Earth's Evolution We Do

On the back of this paper, there are 3 examples of rock columns. Place the rock layers in order from oldest to youngest.

Example #1: (Visual on Back)

Oldest _____ → Youngest

Example #2: (Visual on Back)

Oldest _____ → Youngest

Example #3: (Visual on Back)

Oldest _____ → Youngest

4. In which example could you see folding of rock layers? _____

5. What information would you need in order to determine the absolute data of a rock sample?

6. Occasionally, geologists will find fish fossils in the middle of the desert in Arizona. What best explains this discovery?

Exit Ticket (Closing): What methods allow scientists to tell the age of rocks and what does this tell us about the Earth's history?

Revisiting the Bellringer

Paleontologists discovered fish fossils in the arid deserts of western Egypt. What does the fossil evidence **most likely** indicate about this area's geologic past?

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- b) A giant ocean wave carrying sea life crashed onto the desert.
- c) Mountains in the region once provided water from snowmelt.
- d) The area was moved from the ocean to the desert by plate tectonics.

Exit Ticket (Closing)

What methods allow scientists to tell the age of rocks and what does this tell us about the Earth's history?