

Formation of the Earth: Teacher Notes

- TOPIC: Absolute and relative Dating
- Essential Question: What methods to scientists use to determine the age of rocks?

How has Earth's surface changed, and what causes the changes?

- How the grand canyon was formed video

HOW THE EARTH

WAS FORMED

VIDEO

How do scientists determine the age of rocks?

1. ABSOLUTE DATING:

- a) Based on physical measurements
- b) Radiometric dating uses the rate of decay of the elements within the rock.
- c) Used to date igneous and metamorphic rock.
- d) [CLICK HERE](#) to view video

What is RELATIVE DATING?

- Involves comparing rocks layers to determine what came first.
- [CLICK HERE](#) to view the RELATIVE DATING VIDEO

What is LAW OF SUPERPOSITION?

- Rocks are usually deposited in parallel layers called sequences.
- Oldest rock on the bottom, youngest on top.



Youngest

Oldest

What is the principal of ORIGINAL HORIZONTALITY?

- A rock layer forms from material that was originally deposited horizontally, even if the rock layers no longer appear that way.
- Any change to the layers must have occurred after the layer formed.
- After a deposit the rock can be folded, fractured, tilted, or completely overturned.

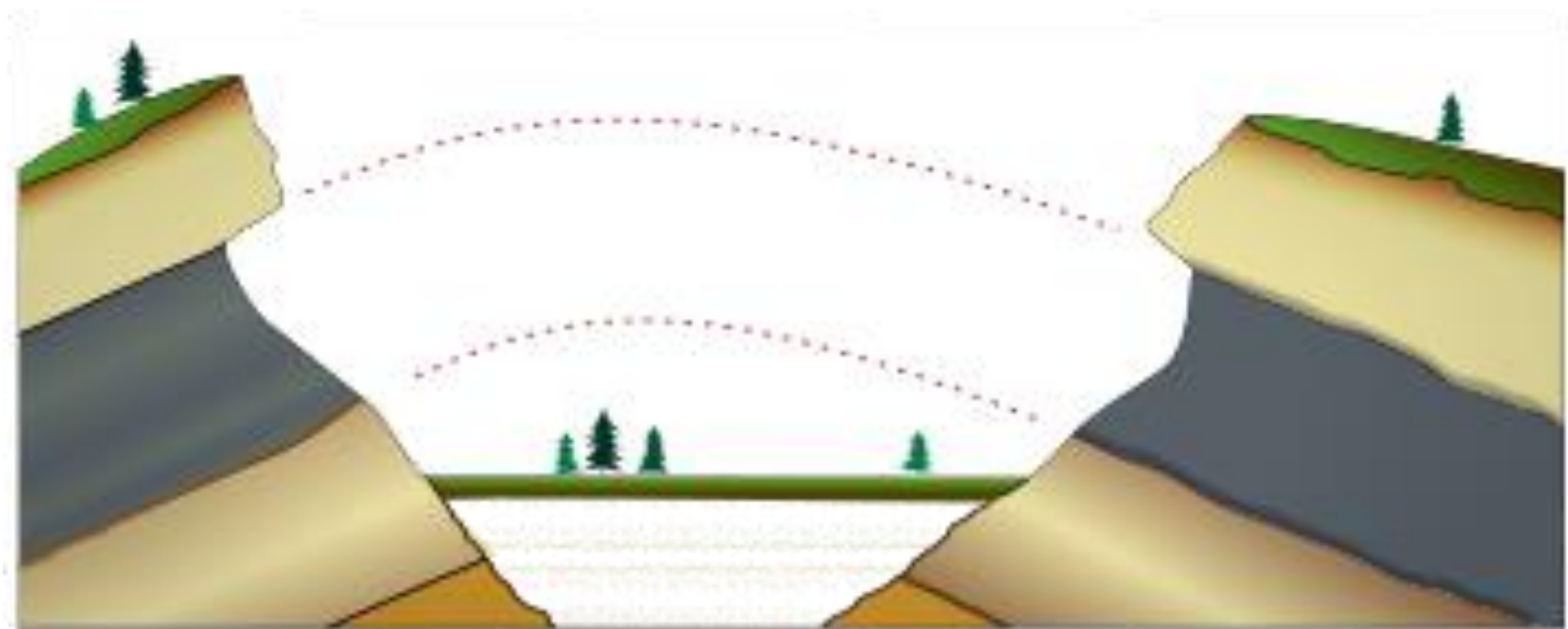






What is the PRINCIPLE OF LATERAL CONTINUITY?

- Layers of rocks that are laid down may extend in all directions.
- Even if erosion occurs you can still trace the layers to the other side of the gap.



What is the PRINCIPAL OF INCLUSION?

- If rocks are found included in other rocks, then they must be older than the rock that contains them.



What are UNCONFORMITIES?

- A change to one or more rock layers that breaks up or disturbs the original horizontality.





How do Scientists use rock and fossil evidence to study Earth's history?

- Finding a marine fossil in rock proves the area was once underwater.
- Plant fossils can be a clue to determine the climate of an area years ago.







How are geologic principles related to how Earth changes over time?

- By studying rock and fossil records scientists have made a timeline of Earth's formation.
- Understanding geologic processes (earthquakes, volcanoes, plate tectonic activity) have occurred for billions of years.

1. Which of the following are evidence of what happened in the past?

- A. volcanoes and plate movement
- B. weathering and rain
- C. Weather and erosion
- D. earthquakes and climate

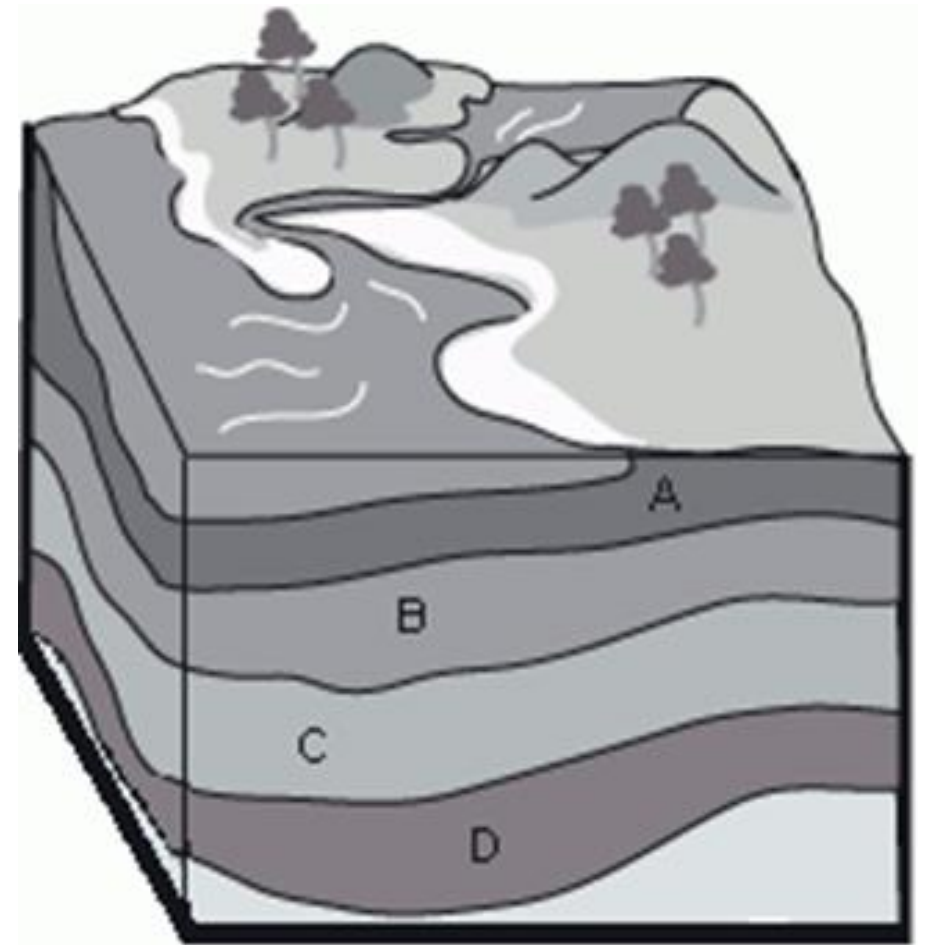
2. Which layer of rock is most probably the oldest?

A. bottom layer (D)

B. top layer (A)

C. layer next to the top (C)

D. layer next to the bottom (B)



3. Which is NOT a method scientists use to determine the age of Earth?

- A. radioactive decay
- B. law of superposition
- C. core rock samples
- D. evolution

4. Techniques used to estimate geologic time include _____.

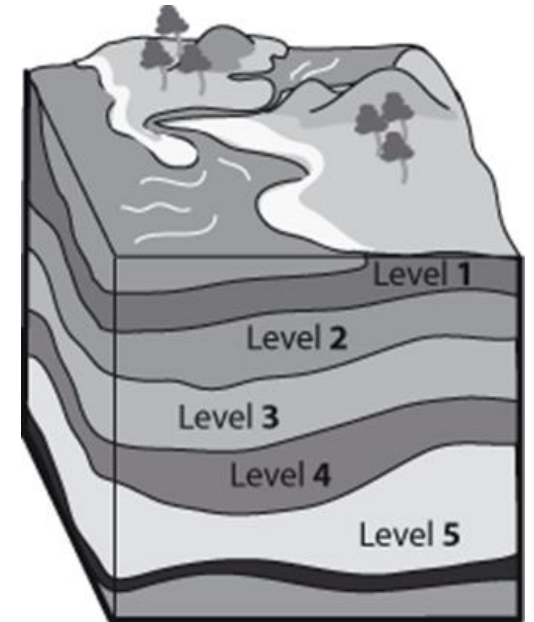
- A. observing rock sequences
- B. studying events such as earthquakes and tsunamis
- C. charting weather patterns
- D. examining prefossilized specimens

5. The earth processes of today, including erosion and movement of lithospheric plates, are _____ to the past.

- A. cyclical
- B. similar
- C. unlike
- D. identical

6. According to the diagram, in which layer would you expect the oldest fossils to be discovered?

- A. Level 1
- B. Level 2
- C. Level 4
- D. Level 5



7. How can scientists determine the absolute age of a rock?

- A. examining the composition of exposed rock
- B. measuring the amount of an isotope in a sample
- C. comparing rock layers to layers above and below
- D. looking at characteristics of fossils embedded in the rock