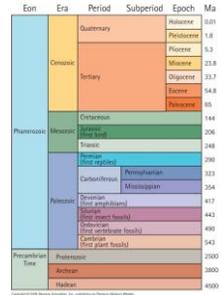


# Chapter 8

## TIMING THE GEOLOGIC RECORD

### Geologic Time Scale



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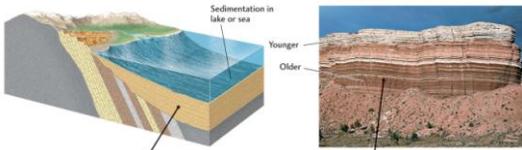
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(a)

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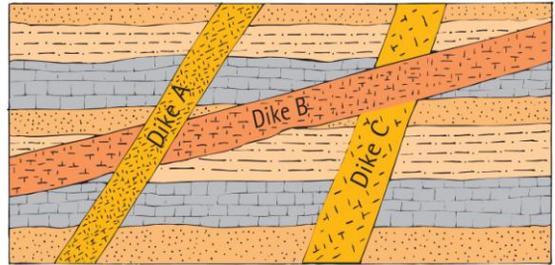
## Superposition and Original Horizontality



- 1 Sediments are deposited in horizontal layers and slowly change into sedimentary rock.
- 2 If left undisturbed by tectonic processes, the youngest layers remain on the top and the oldest on the bottom.

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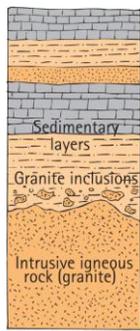
## Cross-cutting relationships



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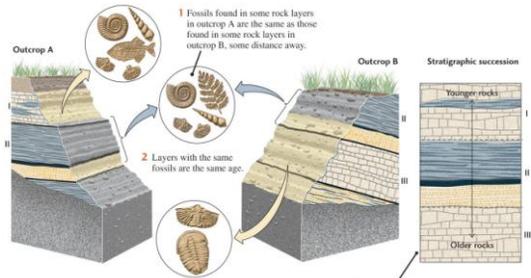
## Principle of Inclusions



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## Fossil succession



- 1 Fossils found in some rock layers in outcrop A are the same as those found in some rock layers in outcrop B, some distance away.
- 2 Layers with the same fossils are the same age.
- 3 A composite of the two outcrops would show formations I and II both overlying formation III and therefore younger than III.

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# Unconformity

**TIME 1**  
Research the sea, sedimentary beds accumulate in layers A, B, and C.

**TIME 2**  
Sea recedes, erosion erases upper portion of the beds above sea level, exposing them to erosion.

**TIME 3**  
Erosion strips away layer D and leaves a flat surface. The irregular surface of hills and valleys.

**TIME 4**  
Subsidence below sea level, sediments are deposited in a new layer D, to be deposited over C. The irregular surface of C is preserved as an unconformity.

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# Angular unconformity

Grand Canyon

Kaibob Plateau

Coloqrado River

Schist Granite Schist

Paleozoic sedimentary rocks

Precambrian sedimentary rocks

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# Making an angular unconformity

(a) Sediments are deposited layer upon layer beneath the sea.

(b) During mountain building solidified sediment layers become folded and deformed. Erosion begins.

(c) As mountain building wanes, the exposed surface is eroded to a more or less even plain.

(d) As the land subsides below sea level, younger sediments are deposited on the former erosional surface.

Angular unconformity

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**Question:**  
What principle would be the best to determine the relative order in which rock units A and B in the image below were formed?

1. Superposition
2. Unconformity
3. Cross-cutting
4. Fossil correlation

10

0% 0% 0% 0%

Superposition Unconformity Cross-cutting Fossil correlation

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**Question:**  
Examine the image of rock layers below. An angular unconformity is present between layers \_\_\_\_ and \_\_\_\_.

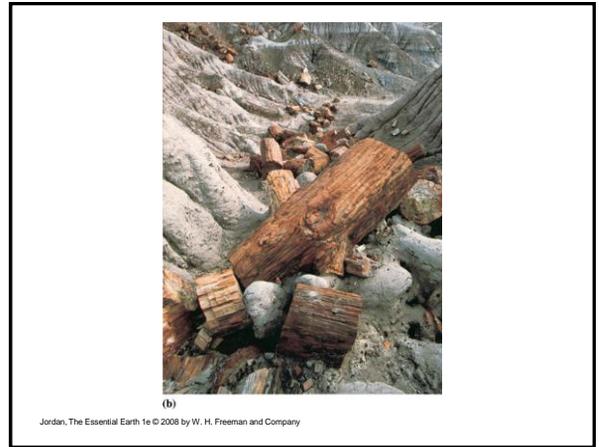
1. B, D
2. D, F
3. C, F
4. D, E
5. E, A



0% 0% 0% 0%

:10

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Examine the image of rock layers below. Which letter represents the layer that was formed earliest?

1. A
2. B
3. C
4. D



0% 0% 0% 0%

10

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